NEW AMERICAN ENCYCLOPEDIA OF SOCIAL AND COMMERCIAL INFORMATION

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NEW AMERICAN ENCYCLOPEDIA

OF

SOCIAL AND COMMERCIAL INFORMATION

A PRACTICAL AND EDUCATIONAL COMPENDIUM
SUITED TO THE NEEDS OF
EVERY-DAY LIFE

Including exhaustive practical treatises especially adapted for self-instruction in English Grammar, Rhetoric and Literature, Modern Languages, the Plastic and Decorative Arts, Music—Vocal and Instrumental; the Theoretical and Practical Sciences; Health, Food, Exercises, Amusements, Games and Pastimes; the Principles of Law, Business and Etiquette; Agriculture, Horticulture and Domestic Economy; History, Politics and Mathematics; together with a multitude of interesting Facts and useful Recipes suited to every-day needs

NEW EDITION, REVISED AND ENLARGED BY

JAMES E. HOMANS, A.M.

Author of "Self-Propelled Vehicles," "A B C of the Telephone," etc.



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PREFACE

A PRACTICAL education is the greatest wealth that man or woman may possess. It is a property that can not be alienated, yet one that may be shared with others without loss. Education is the legacy that all good parents must bequeath to their children. It is an investment that all young people must be persuaded to seek. Some part of every day should be devoted to the acquirement of a little more useful knowledge. Yet so many kinds of information are required nowadays that no school or college supplies enough. "Self-made" means more than ever, and much of the most useful knowledge is that which is acquired in painstaking home-study to which is devoted from a few minutes to an hour daily.

It is this need that this book is intended to supply. It is a practical book, to which men and women liberally informed on their own special topics have contributed their treasures of knowledge in compressed and intelligible form. It is both a manual of study and a work of reference for the whole family, and, while so simple in style that a child may understand it, is a source of power to readers of all ages. Though the primary object of the publishers has been to supply the information of greatest value in business and professional pursuits, a great deal of attention has also been paid to methods of securing that perfect bodily development without which the young man and young woman find themselves outstripped at the beginning of life's race.

No less essential to success is a thorough understanding of the social graces and attainments, which have been exhaustively discussed in these pages. The chapters on Mercantile Law, with forms for all manner of legal documents,

will be found indispensable. The art of writing shorthand, so useful in mercantile or professional life, is fully treated and copiously illustrated. Book-keeping is so exhaustively explained that a teacher is unnecessary, while a "lightning calculator" has been introduced that will save many hours of time in every month.

The Complete Letter Writer puts in the possession of every reader the great art of polite correspondence. The systems herewith presented for the self-teaching of French, German, and Spanish are the simplest and most complete ever published.

While much that is included in these volumes is not distinctly educational, the end of imparting useful and constantly needed information is never overlooked. The several treatises on the English language, including that on words of foreign origin, must prove invaluable. History and governmental theory are treated with sufficient fulness to give a groundwork for future elaboration. The fine arts, including music, have received the space they require. It will be found that the treatises on music contain all that is essential to the beginner, furnishing rules that may be implicitly followed, in order to obtain mastery of the several instruments described.

Technical science is fully represented by the treatises on steam and gas engines and the first principles of electricity. The last-named will be found a particularly complete introduction to the study of this vast subject, about which whole libraries of abstruse works have already been written.

As far as possible, related subjects have been classified together, both for convenience in reference and to enable ready comparison in reading. In short, neither pains nor time has been spared in the effort to render these volumes handy reference books and a ready means for self-education in such practical branches as affect every-day life.

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GRAMMAR

GRAMMAR is the science of language, and its principal use is to show the methods of expressing thoughts with correctness and propriety, avoiding the commonest cause of misunderstanding —the incorrect use of words.

It must always be remembered that grammars can only *define,* but can not *determine,* the correct use of language. This depends, in every instance, upon the forms of thought and meaning to be conveyed; and in all languages was settled and employed long before the studies of grammarians commenced. The importance of a correct use of language can not be overestimated. Laws and treaties have failed and irretrievable blunders have been made because of men who had not taken pains to so express themselves as to make their meaning unmistakable.

In the present treatise the formation and derivation of words are not treated under Etymology, but are added, by way of illustration, in the succeeding article on the derivation of words from foreign roots. By this arrangement, not only do we avoid some repetition, but the subject is more conveniently presented for the student.

THE TWO DEPARTMENTS OF GRAMMAR

ETYMOLOGY (Greek, the "science of true uses and derivations"), which treats of the classification, formation, derivation, and inflection of words by themselves; SYNTAX (Greek, a "setting-together"), which treats of the combination of words into sentences, to the end of conveying definite ideas; making statements of fact, inference or supposition, and asking questions.

The grammar of each particular language differs from that of every other, principally in the different methods of forming words and sentences to convey ideas, and in the use of certain peculiar expressions known as *idioms* (Greek, "private or particular constructions").

Comparative grammar seeks, by comparing the grammars of several languages, to reach the laws of inflection and construction common to them, and finally to all languages. General or historic grammar attempts to explain the growth of language within a specified group.

ETYMOLOGY

LETTERS.—There are twenty-six letters in the English Alphabet: A a, B b, C c, D d, E e, F f, G g, H h, I i, J j, K k, L l, M m, N n, O o, P p, Q q, R r, S s, T t, U u, V v, W w, X x, Y y, Z z.

The number of sounds to be represented by these letters is estimated at about forty; and, in consequence, several of them stand for more sounds than one. It is somewhat remarkable that since this is the case, the letters *c, q,* and *x* should be superfluous; the two sounds of *c* being represented by *s* and *k,* as in *c*ell (*s*ell), *c*alends (*k*alends); *q,* being always followed by *u,* with the sound expressible by *kw;* and the sounds of *x* differing in no respect from those of *ks, gz,* and *z,* in some words borrowed from other languages; as Xerxes (Zerxes) and Xenophon (Zenophon). It would be of considerable advantage, if symbols for the sounds represented now by the combinations of letters, *ch, sh, th, ng,* etc., could be devised and

introduced; but this is a matter of such great difficu'ty as to be almost impossible.

THE VOWELS are *a, e, i, o, u,* and sometimes *w* and *y*. The latter are used as vowels when occurring with other vowels, as *diphthongs,* as in *how, hay*—*y* being used for *i* in many proper names, as Whyte, etc. —although both are consonants at the beginning of words, as in *well, yell.*

The word, *vowel,* comes from the Latin stem, *vocal,* and indicates such a sound as can be made with the vocal organs open, and in a resting position. Thus, a simple vowel may be sounded for a long period, as may be found by experiment:

a, as in *ah,* or as in *at;*
e, as in *beet,* or as in *get;*
i, as in *bit;*
o, as in *boat;*
u, as *oo* in *boot.*

The sound of *i,* as in *bite,* is really *compound* or diphthongal, as is that of *a,* as in *hate:* hence, in attempting to sound either for a prolonged period, the voice automatically separates the two sounds, giving the latter, as may be found by experiment.

The sounds of *r, l, m* and *n* may also be given vocally; whence in some languages, like the Sanskrit, an *r*-vowel and an *l*-vowel are recognized in the alphabet; theoretically, also, an *m*-vowel and an *n*-vowel. The English sounds of *th,* as in *the* and in *thin,* made with the tip of the tongue against the upper and lower front teeth, together with *s, z, ch, sh, v, t, ph, gh,* may also be sounded for a prolonged period, although not properly to be classed with vowels.

THE ENGLISH VOWEL SOUNDS differ from those of all other languages of Europe. Thus, the sound which we express by *a,* they express by *e;* where we write *e,* they write *i;* where we use *i,* they employ *ei;* and our *u* corresponds with their *eu.* We must not forget, however, that the *names* of the vowels in English do not represent their natural, but only their *modified,* sounds—the modification being evidently due to the influence of another vowel in he word, particularly silent *e.* This is in a sense analogous to the vowel modifications met with in other languages. Thus, we have:

SHORT.	MODIFIED.
hat	hate
met	mete
bit	bite
not	note
ŭt	"cute"

The English modified *u,* pronounced *yoo,* as in *unit* (yoonit) or *lute* (lyoot), is also peculiar to our language.

The sound of *i* is modified by certain consonant combinations, such as *gh* and *nd.* Thus: *nig* and *nigh, big* and *bight; bin* and *bind, grin* and *grind.*

The combinations of vowel sounds, called diphthongs and triphthongs, such as *ae, ai, au, ei, ie, oe, oi, ou, eau,* etc., express the intermediate sounds of this series, but they also do not correspond with those of the other European languages.

CONSONANTS (Latin, "a sounding-together") represent the sounds produced when the voice is interrupted by the voluntary action of the throat, tongue, palate, nose, teeth, and lips, and, as the word indicates, may be sounded only *with* some other —to wit, a vowel. Thus, *b* is produced by an opening of the lips, when the tongue is in a particular position in relation to the teeth, and may not be sounded except with a vowel sound either before or after, as *ab* or *ba, eb* or *be,* etc.

THE THREE ORDERS of consonants are Mutes, Sibilants and Liquids; and these are further subdivided according to the organs employed in giving utterance to them. Thus the mutes are classified first as Smooth or Aspirated, and next in the following manner; the sounds for which we have no symbols being inserted in their proper places:

	SMOOTH.		ASPIRATED.	
	Sudden.	*Gradual.*	*Sudden.*	*Gradual.*
Guttural	*k, c, q*	*g*	*ch* (not English)	*gh* (not English)
Dental	*t*	*d*	*th*(in)	*th*(ine)
Labial	*p*	*b*	*f, ph*	*v*

The *ch* here is the terminal sound of the Scotch word "loch"; and the *gh,* that of the Irish word "lough." The letter *h* finds no place in this scheme, because it is, in fact, nothing but a sign of the transmission of the breath called "aspiration," and not of a sound at all.

The sibilants may be classified thus:

	Sudden.	*Gradual.*
Dental	*s, c*	*z*
Dental and Palatal	*sh*	*zh*(ER)
Dental and Guttural	(a)x(ure)	*j*

And the liquids may be arranged in this manner:

Simple	Guttural	*r*
	Palatal	*l*
Nasal	Guttural	(ki)*ng*
	Dental	*n*
	Labial	*m*

The letter *x* represents the sounds of *ks, gz,* and sometimes of *z.*

Of the sounds expressed by the composition of various letters, both vowels and

consonants, nothing more can be said, than that some of them are identical with sounds treated of above; and others are compounded of such sounds. Thus the sound of the word *buoy* is identical with that of *boy;* and in "adhesive," the sound *d* is pronounced distinctly, and followed by the aspirate, or hard breathing *h.*

DERIVATION AND FORMATION OF WORDS

RADICAL WORDS (called by etymologists "roots," simply) are either nouns, verbs, adjectives, or pronouns; expressive of common things, conditions, actions, etc., etc. Primary Derivatives are constructed by slight changes in the vowel sounds, or in the consonants, or in both; and are sometimes designated "stems." Secondary Derivatives are formed by means of prefixes and affixes, from both roots and primary derivatives. Example:

Roots.	*Prim. Deriv.*	*Second. Deriv.*
Bake	batch	baker, baxter
Bear	bier, birth	barrow, forbear
Bind	band, bond, bound	bandage, bondage, bundle
Bite	bit	biter
Bless	bliss	blessing
Blood	bleed	bloody
Brood	breed	
Child		childish
Choose	choice	
Chop	chip	
Deal	dole	
Die	dead, death	deadly
Drive	drove	drover
Duck		duckling
Fall	fell, foal	
(De)file	foul, filth	filthy, fulsome
Find		foundling
Flee	fleet, fly, flight	
Flow	flood	
Forth		further, furtherance
Gape	gap	
Gird		girder, girdle
Gold	gild, gilt	golden, gilding
Good	God	goodness, godly, godliness
Guile	guilt	guilty
Heal (*to cover* or *hide*)	hell, hole, hale, health	hellish, hollow, healer
Lead	lode	leader, mislead
Lend	loan	
Lie	lay, law	lien, lawyer, layer
Lose	loss, loose	loser, unloose
Man		mannikin, manhood
Milk	milch	
Pin	pen, pound	
Pride	proud	
(Be)reave	raven	ravenous
Rise	raise, rouse	arise, arouse
See	sight	sightly
Shake	shock	shocking
Sing	song	singer, songster
Sit	set, seat	settle, settler
Speak	speech	speaker, bespeak
Stick	stake, stitch	
Strike	stroke	
Strong	strength	
Tell	tale	
Trow	truth	truthfulness
Wake	watch	waken, watchful
Weave	woof, web	weaver, webster
Win		winsome
Work	wright	
Wring	wrench, wrong	wrongful
Wry	writhe, wreath	

Derivative words are also formed by composition; that is, by the construction of a single word out of two or more words, each capable of being used independently. These compounds differ entirely from the secondary derivatives, and are found in every class of English words. They are not, however, so numerous in our tongue as in the German; and in that they are less common than in the Greek language. Ex. *Sunshine, fairhaired, thunderstorm, harvestman, daybreak, nevertheless, therefore, into, everlasting, midnight, noontime, elsewhere, however, undersell, overturn, because, hedgerow, warehouseman, earthquake, steamengine, railroad.*

CLASSES OF WORDS

THE CLASSIFICATION of words depends upon their signification as parts of sentences or as they have the nature of Subjects and Predicates, Attributives and Objects, with the various means of expressing the relations between ideas in a sentence.

NOUNS.—Names of things, persons, and of whatever exists, even in imagination, are called *Nouns,* and sometimes *Substantives.* Ex. *Tree, stone; man, boy; Caesar, Wellington; virtue, hope.*

VERBS.—Words expressing an assertion respecting an action or condition, or the reception of the consequences of an action, or simply respecting existence, are called *Verbs.* Ex. *To run; to strike; to sleep, to be; to be beaten.*

ADJECTIVES.—Attributives which can only in figurative language be used without a noun (which they qualify in some way) are called *Adjectives.* Ex. *Good, bad, green, high, everlasting.*

These are the three principal classes of words, which represent distinct notions of things, persons, actions, qualities, etc, formed in the mind. Other words express not so much the notions we have

formed as the connection of those notions with each other, or their relations to us, or some of the infinitely various associations of thoughts.

PRONOUNS serve not only to prevent the too frequent repetition of the same nouns, but yet more to indicate the relation of the persons or things spoken of to the speaker. Such are the *Personal Pronouns.* Others are used as attributives, but they also show the relations of the subjects they characterize to the speaker. Ex. *I, thou, he, they; mine, thine; this, those; whom, what.*

ADVERBS.—Whatever exists, or acts, or is acted upon, is regarded as being, or acting, or being acted on, in some particular time, place, manner, etc., and these modifications of the simple notions indicated by the verb are expressed by a class of words called *Adverbs.* Ex. *Now, where, so, seldom, perhaps.*

PREPOSITIONS.—Many of the relations of notions one to another, also, are those of place, time, manner, means, etc.; and these are expressed by words called *Prepositions,* which serve to connect nouns and pronouns with other nouns and pronouns, and with verbs. Ex. *From, by, of, to, after.*

CONJUNCTIONS. — The connection of things, etc., with each other, and of thoughts with other thoughts, is shown by means of *Conjunctions.* Ex. *And, or, but, though, for.*

NUMERALS are in part names, and in part attributives and adverbs; and therefore do not properly form a class by themselves. Ex. *Two, four, six; first, tenth, hundredth; firstly, secondly, lastly.*

INTERJECTIONS, which are expressions of emotion, such as fear, joy, pain, wonder, etc., and not of thought, and the greater number of which are rather sounds than words, can not be noticed in a grammar; although it is convenient to have such a class to which certain expressions which occur in the Dictionary may be referred. Ex. *Ah! O! Ha!*

NOUNS.—*The Gender of Nouns* is determined by the sex of the persons or beings they represent, being called Masculine or Feminine as they are the names of males or females. Beings without natural sex, things without life, and abstractions are called Neuter.

Figuratively, sex is attributed to many beings naturally having no such distinction, and also to abstractions. Ex. The sun, *he* is setting; the moon, *she* is rising; Charity, *she* is the child of heaven. Very small beings, of whatever sex they may be, and those whose sex is not important in the sentence, are spoken of as neuter. Ex. The ant, *it* is a patron of foresight and prudence; the child, *it* knows not what *it* does.

Very few words, in English, have terminations, or other special forms indicative of gender. The following are a few examples: *Arbiter, arbitress; prosecutor, prosecutrix; margrave, margravine; he-bear, she-bear; man-servant, maid-servant.* In other instances different words are appropriated to the two sexes, without peculiarity of termination. Ex. *Brother,* sister; *horse, mare; king, queen.*

NUMBER.—The only distinction of *Number* is between one and more than one; the former being called Singular; and the latter Plural.

Most commonly, *s* or (when it ends in a sibilant or *x*) *es* is added to the singular. Ex. *Sword, swords; fish, fishes.* Words ending in *f* or *fe* generally make their plurals in *ves.* Ex. *Calf, calves; life, lives.* But all words ending in *ff,* except *staff, staves,* and several words in *f* or *fe,* add *s* without any change of letters for the plural. Ex. *Whiff, whiffs; grief, griefs; fife, fifes.* Those ending in *o,* preceded by a vowel, add *s* only; but if a consonant precede the *o, s* or *es* is added. Ex. *Cameo, cameos; ratio, ratios; cargo, cargoes; volcano, volcanoes; portico, porticoes; solo, solos.* Words ending in *y* after a consonant have *ies* in the plural. Ex. *fly, flies; history, histories.*

A very few change the vowel sound of the singular. Ex. *Foot, feet; goose, geese; tooth, teeth; woman, women* (pronounced *wimmen*). One adds *en* to the singular—*ox, oxen.* One both changes the vowel and adds *en—brother, brethren.*

Besides these, the following must be noted: *Child* makes *children* in the plural. *Mouse* has *mice,* and *louse, lice;* but it is the spelling only which is peculiar. *Penny* has two plurals; when coins are meant, *pennies,* but when money is spoken of, *pence.* In like manner *die,* signifying a stamp for coining, has *dies;* but when it means a cube used in play, *dice. Pea* has *peas* and *pease,* the latter signifying peas collectively, or used for food. *Kine* is sometimes used as a plural to *cow.*

Deer, sheep, swine, are used in both numbers; and (when spoken of as food) *fish, cod, salmon, etc.* The names of metals are made plural only when employed to signify some particular things composed of them. Ex. *Irons, coppers, brasses.* Ar-

ticles of trade and commerce which, in ordinary language, are never used in the plural form, have plural forms in the market. Ex. *Cloths, oils, sugars, teas, etc.*

Words signifying abstract qualities seldom take the plural form, because they can not have a plural meaning, except when used figuratively, that is, to express concrete ideas. Ex. The *honors* of the world; the *decencies* of life. Names of measures, weights, of some numbers, and of terms employed numerically, are in some instances used in the singular form, with a plural meaning. Ex. A ten-*dollar* note, eighteen *hundred* and fifty-eight, an army of eighty *thousand* men, twelve *dozen* of wine, three *brace* of dogs, a fleet of twenty *sail,* twelve thousand *foot* and three thousand *horse,* fifteen thousand *stand* of arms, a hundred *head* of cattle, each weighing thirty *stone.*

Alms, means, news, pains, and *riches,* which are plural in form, are used both as singulars and as plurals. *Ashes, bellows, breeches, cates, dregs, gallows, pincers, scissors,* and *tongs,* have no singulars, either in form or meaning. The names of some sciences, derived from the Greek language, are plural in form, but in meaning singular. Such are *ethics, hydrostatics, mathematics, mechanics, politics.* And so is the term *morals. Suds,* and *wages,* plural in form, are singular in signification; and *pulse* (leguminous seeds), also plural in form, is simply collective in its meaning.

Foreign Words.—Almost all nouns, which have been simply adopted from foreign languages, retain their original plurals; but some have also plurals formed in the English fashion, and in a few instances with a different meaning. The following is nearly a complete list of these words:

Singular.	*Plural.*
Abacus,	abaci.
Addendum,	addenda.
Alluvion, alluvium,	alluvia.
Alto-relievo,	alti-relievi.
Alumnus,	alumni.
Amanuensis,	amanuenses.
Amphibium (not used),	amphibia.
Amphora,	amphoræ.
Analysis,	analyses.
Animalculum (not used),	animalcula.
Antenna,	antennæ.
Antithesis,	antitheses.
Apex,	apices.
Aphelion,	aphelia.
Aphis,	aphides.
Apparatus,	apparatus.
Appendix,	appendices, appendixes.
Aquarium,	aquaria, aquariums.
Arcanum,	arcana.
Automaton	automata, automatons.
Axis,	axes.
Bandit,	banditti.
Basis,	bases.
Basso-relievo,	bassi-relievi.
Beau,	beaux.
Bonvivant,	bonsvivans.
Calculus,	calculi.
Calx,	calces.
Candelabrum,	candelabra.
Catachresis,	catachreses.
Chateau,	chateaux.
Cherub,	cherubim, cherubs.
Cheval-de-frise,	chevaux-de-frise.
Chrysalis,	chrysalides, chrysalises.
Cicerone,	ciceroni.
Cilium,	cilia.
Colossus,	colossi.
Convolvulus,	convolvuli.
Corps,	corps.
Crisis,	crises.
Criterion,	criteria.
Datum,	data.
Desideratum,	desiderata.
Diæresis,	diæreses.
Dictum,	dicta.
Dilettante,	dilettanti.
Effluvium,	effluvia.
Ellipsis,	ellipses.
Emporium,	emporia, emporiums.
Encomium,	encomia, encomiums.
Ephemeris,	ephemerides.
Erratum,	errata.
Eulogium,	eulogia, eulogiums.
Fasciculus,	fasciculi.
Flambeau,	flambeaux.
Focus,	foci, focuses.
Foramen,	foramina.
Formula,	formulæ, formulas.
Fungus,	fungi, funguses.
Fulcrum,	fulcra.
Genius,	geniuses, *persons of genius* genii, *aerial beings.*
Genus,	genera.
Gymnasium,	gymnasia.
Hiatus (*u* short),	hiatus (*u* long).
Hippopotamus,	hippopotami.
Hypothesis,	hypotheses.
Ignis-fatuus,	ignes-fatui.
Improvisatore,	improvisatori.
Inamorato,	inamorati.
Incubus,	incubi.
Index,	indices, *algebraic exponents.* indexes, *pointers, tables of contents.*
Jeu-d'esprit,	juex-d'esprit.
Lamina,	laminæ.
Larva,	larvæ.
Macula,	maculæ.
Madame,	mesdames.
Magus,	magi.
Mausoleum,	mausolea.
Medium,	media.
Memorandum,	memoranda, memorandums.
Memorabile (not used),	memorabilia.
Menstruum,	menstrua.
Mephitis,	mephites.
Metamorphosis,	metamorphoses.
Miasma,	miasmata.
Millennium,	millennia.
Minutia (not used),	minutiæ.
Momentum,	momenta.
Morceau,	morceaux.
Monsieur,	messieurs.
Narcissus,	narcissi.
Nautilus,	nautili.
Nebula,	nebulæ.

Singular.	*Plural.*
Nidus,	nidi.
Nimbus,	nimbi.
Nostrum,	nostra.
Novus homo,	novi homines.
Nucleus,	nuclei.
Oasis,	oases.
Ovum,	ova.
Parenthesis,	parentheses.
Parhelion,	parhelia.
Perihelion,	perihelia.
Phasis,	phases.
Phenomenon,	phenomena.
Polypus,	polypi.
Premium,	premia, premiums.
Proboscis,	proboscides.
Prima donna,	prime donne.
Radius,	radii.
Ranunculus,	ranunculi, ranunculuses.
Regale (not used),	regalia.
Rhombus,	rhombi.
Sarcophagus,	sarcophagi.
Savant,	savans.
Scholium,	scholia.
Scoria,	scoriæ.
Seraph,	seraphim, seraphs.
Series,	series.
Species,	species.
Spectrum,	spectra.
Speculum,	specula.
Sphinx,	sphinges, *hawk-moths.* sphinxes, *in mythology.*
Spicula,	spiculæ.
Stadium,	stadia.
Stamen,	stamens, *parts of flowers.* stamina, *the solids of the human body.*
Stigma,	stigmata, *in botany and surgery.* stigmas, *marks of reproach.*
Stimulus,	stimuli.
Stratum,	strata.
Stria,	striæ.
Symposium,	symposia.
Synopsis,	synopses.
Synthesis,	syntheses.
Tableau,	tableaux.
Terminus.	termini.
Thesis,	theses.
Triumvir,	triumviri, triumvirs.
Tumulus,	tumuli.
Vertebra,	vertebræ.
Vertex,	vertices.
Virtuoso,	virtuosi.
Viscus (rare),	viscera.
Vortex,	vortices.

The Cases of Nouns.—When a noun is the subject of a sentence it is said to be in the *nominative case,* and when it immediately follows a verb or a preposition it is said to be in the *objective case,* but its form is precisely the same in both cases. Ex. Nom. The *man* walks; *trees* grow. Obj. I pity the *man;* he fells the *trees;*—with the *man;* under the *trees.*

When one noun, in either the singular or plural number, is used along with another attributively, and indicating its possessor or origin, *'s* (with an apostrophe before it, which shows that a vowel sound has been dropped) is added to the former, except when it ends in a sibilant, when most frequently only the apostrophe is added. The same rule holds for plurals made with *s.* Ex. A *soldier's* life; the *soldiers'* friend; the *jury's* verdict; the *judges'* sentence; *Thomas's* horse (read "Thomases"); the *fox'* (read "foxes") brush; "He that despised *Moses'* law, died;" "If ye suffer for *righteousness'* sake, happy are ye."

Declension of a Noun.

	Singular.	Plural.
Nominative Case, } *Objective Case,* }	King,	Kings.
Possessive Case.	King's,	Kings'.

The Articles.—In order to individualize the application of common nouns, two words usually designated articles, one an adjective, *the,* the other a numeral, *an* (or, as abbreviated before a consonant sound, *a*), almost universally precede them. The former, which is called the definite article, is used before nouns of both numbers. Ex. *The man, the men; the horse, the horses.* The latter is called the indefinite article, and is used before nouns in the singular number only. Ex. *A man, an hour, a tree, an enemy.*

Proper Names, abstract nouns, names of materials, and some other classes of nouns, take the articles only when they are used as common nouns. Ex. *Solon. Brutus, hope, fear, water, wood; the Solon* of his country; he is *a Brutus; the hopes and fears* of youth; *the water's* edge; *the wood* of the ark.

Uses of Verbs.—When the action signified by a verb immediately affects any person or thing as its object, the verb is called transitive or active; but when the action is completely described by the verb itself, or when the verb signifies a condition, it is called intransitive or neuter. Ex. Transitive: We *suspect deceit,* he *loves truth.* Intransitive: I *walk* or *run,* they *sleep,* you *stand.* Many verbs are both active and neuter. Ex. *To abate a nuisance, the storm abated; to account a man wise, to account for one's conduct.*

Transitive Verbs are conjugated in two ways: one form, called active, is used when the agent is the subject of the verb. Ex. *I esteem* him; *they speak* both French and German; *the Allies defeated* the Russians. The other is used when the agent is the immediate object of the verb, and is called passive. Ex. He *is esteemed by me;* both French and German *are spoken by them;* the Russians *were defeated by the Allies.*

THE CONJUGATION OF VERBS.—In the conjugation of verbs, four moods are distinguished—the *indicative*, the *subjunctive*, the *imperative*, and the *infinitive*—and another class of forms, called *participles*. The indicative is used when the speaker asserts something as actually existing or acting. Ex. *He reads, we walked, they will consent, thou art punished, I was exalted.* The subjunctive is used when some possible or probable action or state of being is spoken of, and generally occurs with, *if, though,* or some other word expressing contingency. Ex. *"If I be* a father, where is mine honor?" *"Though thou detain* me, I will not eat;" *"If he were* a prophet, he would have known who touched him;" *"Though these three men were* in it, they should deliver neither son nor daughter." When a command is given, the imperative is employed. Ex. *"Honor* all men. *Love* the brotherhood. *Fear* God. *Honor* the king." The infinitive mood consists of the substantive forms, and the participles of the attributive forms, of the verb to which they belong. The preposition *to* is prefixed to all infinitives, except those which follow auxiliary verbs, and such verbs as *see, hear, etc.,* in the active voice. Ex. *"To err* is human; *to forgive,* divine;" *to have praised, to have been blamed;* I saw him *weep,* he was seen *to weep.*

THE THREE TENSES OF VERBS, or the times in which an action or event may be said to take place, are the present, the past, and the future; and in each of them, it may be considered as indefinitely, or imperfectly, or perfectly accomplished. Ex. (Indef. pres.) *I read,* (imperf. pres.) *I am reading,* (perf. pres.) *I have read;* (indef. past) *I read,* (imperf. past) *I was reading,* (perf. past) *I had read;* (indef. fut.) *I shall read,* (imperf. fut.) *I shall be reading,* (perf. fut.) *I shall have read.* In the subjunctive mood, the tense forms express the probability or improbability of the event or action spoken of. Ex. (Prob.) "What matter where, *if I be* still the same?" *"Though thou detain* me, I will not eat." (Improb.) *"If ye were* of the world, the world would love his own." *"If ye loved* me, ye would rejoice."

The imperative mood admits of no distinctions of time, but only of the completeness or incompleteness of the action commanded. Ex. (Imperf.) *Read thou,* (perf.) *Have done!*

In the infinitive mood the only tense is the present. Ex. (Indef. pres.) *to read,* (imperf. pres.) *to be reading,* (perf. pres.) *to have read.* And the participles admit only of the distinctions of completeness and incompleteness of the action spoken of. Ex. (Imperf.) *reading,* (perf.) *read.*

AUXILIARY VERBS.—By means of a class of verbs, called *auxiliary verbs,* the capability of expressing the several relations of mood, tense, etc., is greatly extended and refined. Those tenses which are formed without the assistance of auxiliaries are called simple tenses, and the others, compound.

The auxiliary verbs of mood are such as *may* and *can,* which express possibility; *must, ought,* and *shall,* which express obligation; *shall* and *will,* expressing determination of will; *might, could,* and *would,* expressing desire; *let* and *may,* implying permission; *do,* which adds emphasis to assertion, and is employed in negatives and questions, etc. Ex. *It may be* so, *he can do* it, *you must see* that *you should obey,* "these things *ought* not so *to be,*" *we shall see* to that, *I will be heard, might it* but *be* so! *could we* but *know* it, *would he were* here! *let him do* what he will, *you may do* as you please, *we do like* simplicity, *it does not* signify, *do you see* the meaning?

The auxiliary verbs of tense are such as *be, be about, be going, begin, do, have, keep, shall, will,* etc. Ex. *You are chosen; they were laughing; we are about to depart; we are going to learn* French; *I did* once *think; he has seen* too much; *they kept expecting* what was impossible; *he would dance* and *sing* the whole day long.

All the moods, tenses, etc., of the passive forms of verbs are made by the help of the verb *be.* Ex. *I am praised, we were loved, they shall be beaten, to be afflicted, having been disappointed.*

INFLECTIONAL FORMS.—The only distinctive personal forms are those of the second and third persons singular of the present indefinite tense, and the second person singular of the past indefinite; all the other persons in each of the simple tenses are alike. Ex. *I lead, thou leadest, he leads (leadeth), we lead, you lead, they lead. I led, thou leddest, he led, we led, you led, they led.*

IMPERSONAL VERBS, of which there are but two in our language (strictly so to be called), are found only in the third person singular. Ex. *"Meseems* I hear her singing loud," *meseemed; "methinks* he breaks it," *"methought* I saw my late espoused wife." But other verbs are often used impersonally. Ex. *It rained* last night, *it liked* him well, *it behooved* him to do the same.

THE PAST TENSE.—By far the greater number of *English verbs*, including all that have been recently introduced, and almost all derivatives, are of the class called *weak verbs*, that is, they form their past indefinite tenses, and their perfect participles, by the addition of *d* (or *t*) to the present, or *ed* when the present ends in *d* or *t*. Ex. *Hope, hoped; light, lighted.* But it must be observed, there is a great difference between our spoken and our written language in this particular; the forms of the latter having departed widely from the sounds of the former. Ex. *Walk, walked* (pron. *walkd*); *step, stepped* (pron. *stept*); *stab, stabbed* (pron. *stabd*); *bar, barred* (pron. *bard*).

The remainder form their past indefinite tenses and perfect participles either (1) by modifying the verbal sound, and adding *n* or *(en)* for the participle (being of the class called strong verbs); (2) by modifying the vowel, and adding *t* for the participle; (3) by changing the terminal *d* into *t;* or (4) by retaining the present form for both the tense and the participle. But the tendency to uniformity is so strong that many of these verbs have lost one or both of their peculiar forms, and others have two forms for the past indefinite and perfect participle.

The following is a complete list of these verbs, classified mainly by their present forms. The original forms of many of them are obsolete, and such forms are inclosed in parentheses. Sometimes the past tense is used for the participle, and sometimes the terminal *n* or *en* has been dropped.

First Division. Verbs which change their vowel sounds, and form their perfect participles by adding *en* or *n*, are strong verbs.

1st Class. Vowels *e* and *a*, becoming *e*, *a*, or *o*.

Present Indef. Tense.	*Past Indef. Tense.*	*Perfect Participle.*
Delve	(dolve, dalf) delved	delved
Get	got (gat)	(gotten) got
Help	(holp, halp) helped	(holpen) helped
Melt	(molt) melted	molten, melted
Sweat	(swote, swat,) sweat, sweated	(sweaten) sweated
Swell	(swoll) swelled	swollen, swelled
Yell	(yoll) yelled	yelled
Burst	(brast) burst	(borsten) burst
Beat	beat	beaten, beat
Eat	eat, ate	eaten, eat
Bear (*bring forth*)	bore (bare)	born
Bear (*carry*)	bore (bare)	borne
Break	broke (brake)	broken, broke
Cleave (*adhere*)	(clave) cleaved	cleaved
Cleave (*split*)	(clove, clave) cleft	cloven, cleft
Creep	(crope) crept	crept
(Falde) fold	folded	(folden) folded
Freeze	froze	frozen
Heave	(hove) heaved	(hoven) heaved
(Queath)	quoth	
Lead	(lode, lad) led	led
Leap	(lope) leapt, leaped	leapt, leaped
Seethe	(soth) sod, seethed	sodden
Shear	(shore) sheared	shorn
Speak	spoke (spake)	spoken
Steal	stole (stale)	stolen
Swear	swore (sware)	sworn
Tear	tore (tare)	torn
Tread	trode, trod, (trade)	trodden, trod
Wear	wore (ware)	worn
Weave	wove	woven
Weep	(wope) wept	wept
Wreak	(wroke) wreaked	(wroken) wreaked
Wreathe	wreathed	wreathen, wreathed
Yield	(yolde) yielded	yielded
(Be)		been
See	saw	seen
Awake, wake	awoke	awaked
Bake	(boke) baked	(baken) baked
Forsake	forsook	forsaken
Grave	(grove) graved	graven, graved
Lade	(lode) laded	laden, loaden
Shake	shook, shaked	shaken, shaked
Shape	(shope) shaped	shapen, shaped
Shave	shaved	shaven, shaved
Stave	stove	
Take	took	taken
Stand	stood	stood
Wax	(wox, wex) waxed	(waxen) waxed

2d Class. Vowel *i*, becoming *a*, *o*, *u*, or *ou*.

Begin	began (begon)	begun
Cling	clung (clong)	clung
Dig	dug, digged	dug, digged
Drink	drank (drunk, dronk)	drunken, drunk
Fling	flung (flang, flong)	flung
Hang (hing)	hung, hanged	hung, hanged
Ring	rang, rung (rong)	rung
Run (rin)	ran	run
Shrink	shrank, shrunk (shronk)	shrunken, shrunk
Sing	sang, sung (song)	sung
Sink	sank, sunk (sonk)	sunken, sunk
Sling	(slang) slung (slong)	slung
Slink	(slank) slunk (slonk)	slunk
Spin	(span) spun (spon)	spun
Spring	sprang, sprung (sprong)	sprung
Stick	stuck (stoke)	stuck
Sting	(stang) stung (stong)	stung
Stink	stank, stunk (stonk)	stunk
String	(strang) strung	strung
Swim	swam, swum (swom)	swum
Swing	(swang) swung (swong)	swung
Swink	(swank, swonk) swink	(swonk) swinkt
Win	(wan) won	won
Wring	wrung, wringed	wrung

Present Indef. Tense.	*Past Indef. Tense.*	*Perfect Participle.*
Bid	bade (bode), bid	bidden, bid
Give	gave (gove)	given
Sit	sate	sitten, sate
Slit	(slat) slit, slitted	slitten, slit, slitted
Spit	spat, spit	spitten, spit, spat
Betide	betid	betid
Hide	hid	hidden, hid
Light	lit, lighted	lit, lighted
Slide	slid	slidden, slid
Abide, bide	abode	abode
Arise, rise	arose (aris)	arisen
Bite	(bote, bat) bit	bitten, bit
Chide	(chode) chid	chidden, chid
Climb	(clomb, clamb) climbed	climbed
Dive	(dove) dived	dived
Drive	drove (drave)	driven
Glide	(glode, glid) glided	glided
Hight	(hote, hete)	
Lie	lay	lien, lain
Ride	rode, rid	ridden, rid
Rive	(rove) rived	riven
Shrive	(shrove) shrived	shriven
Smite	smote (smate), smit	smitten, smit
Stride	strode, strid	stridden
Strive	strove	striven
Thrive	throve, thrived	thriven
Write	wrote (wrate) writ	written, writ, wrote
Writhe	writhed	writhen, writhed
Shine	shone, shined	shone, shined
Wit (wite)	(wote) wot	
Strike	(stroke) struck	stricken, struck
Bind	bound (bond)	bounden, bound
Fight	fought	foughten, fought
Find	(fand, fond) found	found
Grind	ground	ground
Wind	wound (wond), winded	wound

3d Class. Vowel *o*, becoming *e* in past tense.

Draw	drew	drawn
Fall	fell	fallen
Saw	sawed	sawn, sawed
Wash	(wesh) washed	washen, washed
Blow	blew	blown
Crow	crew, crowed	crowed
Fly	flew	flown
Grow	grew	grown
Hew	hewed	hewn, hewed
Hold	held	holden, held
Know	knew	known
Mow	(mew) mowed	mown, mowed
Show	(shew) showed	shown, showed
Snow	(snew) snowed	snowed
Sow	(sew) sowed	sown, sowed
Strow, strew (straw)	strewed, strowed	strewn, strown, strewed
Throw	threw	thrown
Let (late)	let	let
Slay	slew	slain
Laugh	(loghe, leugh) laughed	laughed

4th Class. Vowel *o*, shortened.

Present Indef. Tense.	*Past Indef. Tense.*	*Perfect Participle.*
Choose	chose (chase)	chosen
Go		gone
Lose	lost	(lorn) lost
Shoot	shot	shotten, shot
Do	did	done

5th Class.

Come	came	come

Second Division. Verbs which change their vowel sound, but form their perfect participles in *d* or *t;* and are therefore weak verbs.

1st Class. Vowels shortened.

Bleed	bled	bled
Breed	bred	bred
Feed	fed	fed
Meet	met	met
Read	read	read
Speed	sped	sped
Bereave, reave	bereft, bereaved	bereft, bereaved
(Clepe)		y-clept
Deal	dealt	dealt
Deem	(dempt) deemed	deemed
Dream	dreamt, dreamed	dreamt, dreamed
Feel	felt	felt
Flee	fled	fled
Hear	heard	heard
Keep	kept	kept
Kneel	knelt, kneeled	knelt, kneeled
Lean	leant, leaned	leant, leaned
Mean	meant	meant
Sleep	slept	slept
Sweep	swept	swept
Shoe	shod	shod

2d Class. Vowels *a, e, i,* and *o*, changed into *o, au, ou.*

Sell	sold	sold
Tell	told	told
Catch	caught, catched	caught, catched
Reach	(raught) reached	(raught) reached
Stretch	(straught, streight) stretched	stretched
Teach	taught	taught
Distract	distracted	(distraught) distracted
Freight	freighted	fraught, freighted
Shall	should	
Will	would (woll)	
May	(mought) might	
Beseech	besought	besought
Bring	brought	brought
Buy	bought	bought
Own	ought, owed	owed
Seek	sought	sought
Think	thought	thought
Work	wrought, worked	wrought, worked

Note, that the *y* in *"y-clept"* is the old participial prefix, of which only one other instance remains in occasional use in our language, *"y-clad."*

Third and Fourth Divisions. Contracted Weak Verbs.

Present Indef. Tense.	*Past Indef. Tense.*	*Perfect Participle.*
Have	had	had
Make	made	made
Lay	laid	laid
Pay	paid	paid
Say	said	said
Dwell	dwelt, dwelled	dwelt, dwelled
Pen	penned	pent, penned
Spill	spilt, spilled	spilt, spilled
(Wis)	(wist)	
Bend	bent, bended	bent, bended
Build	built, builded	built, builded
Gild	gilt, gilded	gilt, gilded
Gird	girt, girded	girt, girded
Lend	lent	lent
Rend	rent	rent
Send	sent	sent
Shend	shent	shent
Spend	spent	spent
(Wend)	went	
Cast	cast	cast
Cost	cost	cost
Cut	cut	cut
Hit	hit	hit
Hurt	hurt	hurt
Knit	knit, knitted	knit, knitted
Lift	lift, lifted	lift, lifted
Put	put	put
Quit	quit, quitted	quit, quitted
Rid	rid	rid
Roast	roasted	roast, roasted
Set	set	set
Shed	shed	shed
Shred	shred	shred
Shut	shut	shut
Split	split, splitted	split, splitted
Spread	spread	spread
Thrust	thrust	thrust
Wet	wet, wetted	wet, wetted

Defective Verbs.

Am	was	been
Clothe	clad, clothed	(y-clad) clothed
Go	went	gone

In the first of these, each part belongs to a different verb; in the second, *"clad"* and *"y-clad"* are derived from some word not greatly unlike *"clothe"*; and both forms in this kind have appeared in the preceding lists.

Irregular Verbs.

Can	could
Dare, durst	durst

It is the introduction of the *l* into *"could,"* which makes the former of these irregular. The other appears to have adopted its original past tense as an additional form for the present; when used transitively, in the meaning of "to challenge or provoke," its past tense and perfect participles are *"dared."*

CONJUGATION OF AUXILIARY VERBS.

1. To Be.

Indicative Mood. Present Indefinite Tense.

Sing. 1. I am, 2. Thou art, 3. He is,
Plur. 1. We are, 2. You are, 3. They are.

Past Indefinite Tense.

Sing. 1. I was, 2. Thou wast, 3. He was,
Plur. 1. We are, 2. Thou were, 3. They were.

Subjunctive Mood. Form implying probability.

Sing. and *plur.* (If) I, thou, he, we, you, they be.

Form implying improbability.

Sing. and *plur.* (If) I were; thou wert; he, we, you, they were.

Imperative Mood.

Sing. Be thou. *Plur.* Be ye.

Infinitive Mood. Present Indefinite Tense.

To be.

Participles.

Imperfect. Being. *Perfect.* Been.

2. To Have.

Indicative Mood. Present Indefinite Tense.

Sing. 1. I have, 2. Thou hast, 3. He hath or has,
Plur. 1. We have, 2. You have, 3. They have.

Past Indefinite Tense.

Sing. 1. I had, 2. Thou hadst, 3. He had,
Plur. 1. We had, 2. You had, 3. They had.

Subjunctive Mood. Probable form.

Sing. and *plur.* (If) I, thou, he, we, you, they have.

Improbable form.

Sing. and *plur.* (If) I had; thou hadst; he, we, you, they had.

Infinitive Mood. Present Indefinite Tense.

To have.

Participles.

Imperfect. Having. *Perfect.* Had.

3. To Do.

Indicative Mood. Present Indefinite Tense.

Sing. 1. I do, 2. Thou dost, 3. He doth or does,
Plur. 1. We do. 2. You do, 3. They do.

Past Indefinite Tense.

Sing. 1. I did, 2. Thou diddest or didst, 3. He did,
Plur. 1. We did, 2. You did, 3. They did.

Subjunctive Mood. Probable form.

Sing. and *plur.* (If) I, thou, he, we, you, they do.

Improbable form.

Sing. and *plur.* (If) I did; thou didst; he, we, you, they did.

Infinitive Mood. Present Indefinite.

To do.

Participles.

Imperfect. Doing. *Perfect.* Done.

In the auxiliaries, *may, can, shall, will,* the only change of form is in the second person singular, which are *mayest, might-*

est; canst, couldst; shalt, shouldst; wilt, wouldst; in the present and past tenses respectively. *Let* and *must* have no inflexions, and *ought* (which admits of no distinction of time) has *oughtest* in the second person singular.

Perfect Tense.

Singular.	*Plural.*
I might, could, would, *or* should be,	We might, could, would, *or* should be,
Thou mightst, couldst, wouldst, *or* shouldst be,	Ye *or* you might, could, would, *or* should be,
He might, could, would, *or* should be,	They might, could, would, *or* should be.

Pluperfect.

I might, could, would, *or* should have been,	We might, could, would, *or* should have been,
Thou mightst, couldst, wouldst, *or* shouldst have been.	Ye *or* you might, could, would, *or* should have been,
He might, could, would, *or* should have been.	They might, could, would, *or* should have been.

Perfect Tense.

Singular.	*Plural.*
I might, could, would, *or* should have,	We might, could, would, *or* should have,
Thou mightst, couldst, wouldst, *or* shouldst have,	Ye *or* you might, could, would, *or* should have,
He might, could, would, *or* should have.	They might, could, would, *or* should have.

Pluperfect.

I might, could, would, *or* should have had,	We might, could, would, *or* should have had,
Thou mightst, couldst, wouldst, *or* shouldst have had,	Ye *or* you might, could, would, *or* should have had,
He might, could, would, *or* should have had,	They might, could, would, *or* should have had.

CONJUGATION OF THE IRREGULAR VERB, TO SEE.

ACTIVE VOICE.

INDICATIVE MOOD.

Indefinite.	*Imperfect.*
	Present.
I see,	I am seeing,
Thou seest,	Thou art seeing,
He seeth, or sees,	He is seeing,
We see,	We are seeing,
You see,	You are seeing,
They see.	They are seeing.
	Past.
I saw,	I was seeing,
Thou sawest,	Thou wast seeing,
He saw,	He was seeing,
We saw,	We were seeing,
You saw,	You were seeing,
They saw.	They were seeing.
	Future.
I shall see,	I shall be seeing,
Thou wilt see,	Thou wilt be seeing,
He will see,	He will be seeing,
We shall see,	We shall be seeing,
You will see,	You will be seeing,
They will see.	They will be seeing.

Imperative.

See thou,	Be thou seeing,
See you.	Be ye seeing.

Infinitive Present. To see, To be seeing.
Participle. Seeing.

Perfect.

Singular.	*Plural.*
I have seen,	We have seen,
Thou hast seen,	You have seen,
He has seen.	They have seen.

Pluperfect.

I had seen,	We had seen,
Thou hadst seen,	You had seen,
He had seen.	They had seen.

Future Perfect.

I shall have seen,	We shall have seen,
Thou wilt have seen,	You will have seen,
He will have seen.	They will have seen.

Perfect Infinitive. To have seen.
Perfect Participle. Seen.

SUBJUNCTIVE MOOD.

Present.

Probable.	*Improbable.*
(If) I see,	(If) I saw,
(If) Thou see,	(If) Thou sawest,
(If) He see,	(If) He saw,
(If) We see,	(If) We saw,
(If) You see,	(If) You saw,
(If) They see.	(If) They saw.
Imperfect.	
(If) I be seeing,	(If) I were seeing,
(If) Thou be seeing,	(If) Thou wert seeing,
(If) He be seeing,	(If) He were seeing,
(If) We be seeing,	(If) We were seeing,
(If) You be seeing,	(If) You were seeing,
(If) They be seeing.	(If) They were seeing.
Perfect.	
(If) I have seen,	(If) I had seen,
(If) Thou have seen,	(If) Thou hadst seen,
(If) He have seen,	(If) He had seen,
(If) We have seen,	(If) We had seen,
(If) You have seen,	(If) You had seen,
(If) They have seen.	(If) They had seen.

PASSIVE VOICE.

INDICATIVE MOOD.

Present.

Singular.	*Plural.*
I am seen,	We are seen,
Thou art seen,	You are seen,
He is seen.	They are seen.
Past.	
I was seen,	We were seen,
Thou wast seen,	You were seen,
He was seen.	They were seen.
Future.	
I shall be seen,	We shall be seen,
Thou wilt be seen,	You will be seen,
He will be seen.	They will be seen.
Perfect.	
I have been seen,	We have been seen,
Thou hast been seen,	You have been seen,
He has been seen.	They have been seen.
Pluperfect.	
I had been seen,	We had been seen,
Thou hadst been seen,	You had been seen,
He had been seen.	They had been seen.
Future Perfect.	
I shall have been seen,	We shall have been seen,
Thou wilt have been seen	You will have been seen,
He will have been seen.	They will have been seen.

SUBJUNCTIVE MOOD.

Probable.	*Improbable.*
Indefinite.	
(If) I be seen,	(If) I were seen,
(If) Thou be seen,	(If) Thou wert seen,
(If) He be seen,	(If) He were seen,
(If) We be seen,	(If) We were seen,
(If) You be seen,	(If) You were seen,
(If) They be seen.	(If) They were seen.
Perfect.	
(If) I have been seen,	(If) I had been seen,
(If) Thou have been seen,	(If) Thou hadst been seen
(If) He have been seen,	(If) He had been seen,
(If) We have been seen,	(If) We had been seen,
(If) You have been seen,	(If) You had been seen,
(If) They have been seen.	(If) They had been seen.

Imperative.	Be thou seen,	Be ye seen.
Infinitive Present.	To be seen.	
Infinitive Perfect.	To have been seen.	
Participle Indefinite.	Being seen.	
Participle Perfect.	Having been seen.	

By means of the various *auxiliaries* a great number of additional tenses, in all the moods, might be formed.

In the passive, the imperfect tenses can not be formed except for a few verbs, and then only in the past and present, and in two ways—*"the house is building,"* or *"the house is being built;" "the books were printing,"* or *"were being printed."* Formerly the first of these forms was different. Ex. *The ark was a-preparing.*

The term, *indefinite,* as applied to the conjugation of a verb, refers to the *time,* expressed or implied. Thus, the expression, *"I should like to see,"* involves no consideration of the *time* of seeing, whether present or future; whereas, the expression, *"I should like to be seeing,"* is a colloquial form for *"I should like to see now."* Similarly, in saying, *"I do anything,"* the meaning may be that the thing done is a matter of custom, past as well as present; whereas, in saying, *"I am doing,"* the obvious meaning is that the present time is referred to. Thus, *"I am doing it"* is equivalent to saying, *"I do it now."* Such a form, constructed of an auxiliary verb and the present participle in *ing,* is called *imperfect,* as indicating an action *in process,* and not yet completed. The term, *imperfect,* in Latin, and some other grammars, refers to the preterit or past tense.

ADJECTIVES.—There are no changes of forms in the adjectives, to show their relations to the nouns they qualify, as to gender, number or case. Ex. A *wise man, wise men;* a *tall man,* a *tall woman,* a *tall tree;* they saw the *powerful king's golden crown;* he defeated *three great emperors' vast armies.* But the degree of intensity in which any quality is regarded as characterizing one or more persons or things, when compared with others, is expressed by the addition of *er* (or *r*) and *est* (or *st*) to the simple (or positive) form of the adjective;—the former (called the comparative degree) being employed where only two subjects are compared, the latter (named the superlative) when a subject is compared with more than one other in respect of the same quality. Ex. This tree is *taller* than that, but the next is the *tallest* of the three, and those trees are the *tallest* in the wood; this man is *wiser* than those and those men are the *wisest* in our country; platinum is the *heaviest* metal, or platinum is *heavier* than any other metal.

Instead of using these inflections, with *adjectives of more than one syllable,* the comparative is frequently formed by prefixing *more,* and the superlative by prefixing *most,* to the simple form. Ex. A *more prudent* man, the *most prudent* conduct; *more seasonable* weather, *most unseasonable* importunities.

Some adjectives are defective, or have comparatives and superlatives formed from other words; and some do not form them according to the common rule. The following are the principal adjectives to which these remarks apply:

Bad	worse (worser)	worst
Far	farther	farthest
Fore	further	furthest, first
Good	better	best
Late	later, latter	latest, last
Little	less, lesser	least
Much, many	more	most
Near, nigh	nearer, nigher	nearest, next
Old	older, elder	oldest, eldest

Another class of adjectives differ from the common rule in having a positive signification with the comparative form (as is the case with the comparatives *superior, inferior, exterior,* and *interior,* borrowed from the Latin), and only a superlative degree of comparison besides. Ex. *Former, foremost; hinder, hindmost,* and *hindermost; hither, hithermost; inner, inmost,* and *innermost; nether, nethermost; outer, outmost,* and *outermost; under, undermost; upper, upmost,* and *uppermost; utter, utmost,* and *uttermost.* The following superlatives also occur: *midmost* for *midst, northernmost* and *southernmost.*

Different degrees of intensity are also more generally expressed by the use of some adverbs. Ex. *Too hot, very cold, exceedingly angry. "Less"* and *"least"* are employed when the comparison regards lower degrees of intensity. Ex. *Less scrupulous, least scrupulous.*

NUMERALS.—When the cardinal numerals are employed to signify abstract numbers, they are nouns. Ex. *Four* and *three* are *seven, two* and *one* are *three.* But when used to express concrete quantities they are adjectives. Ex. *Four* horses, *ten* men, a *hundred* pounds.

The ordinal numerals (which signify position in a series) are most frequently adjectives. Ex. The *first* man, the *tenth* sheep, the *thirtieth* day. But they are sometimes used objectively, and then are adverbs. Ex. He stands *first,* I am *tenth* on the list. They are also the regularly formed adverbial ordinal numerals, *firstly, secondly, thirdly, etc.*

Fractional numerals are the same as ordinals, but they are nouns, and are so because they are abbreviations. Ex. One-*third* (for "one *third part*") three-*fourths* (for "three *fourth parts*"), four-*fifths,* two-*tenths* of an inch. In this series *first* is omitted, *half* is used for *second,* and *quarter* is often substituted for *fourth.*

Besides these there are the reiterative numerals, *once, twice, thrice, four times, etc.;* the multiplicatives, *single, double* or *two-fold, triple* or *three-fold, quadruple* or *four-fold, etc.;*—the distributives, *singly* or *one by one, two by two, etc.;* and other classes.

The words *neither, either, other, both, next, again, then,* and some others, which are also called pronouns, are frequently employed as numerals, to signify *not one, one, second, two, secondly, etc.*

Intermediate numerals express number and quantity, but not definitely. They are such words as *more, some, none, few, many, several, much, all, etc.*

PRONOUNS.—Those which are used as nouns only, are the personal pronouns, *I, thou, he, she, it,* and their plurals. They are thus declined:

	First Person.		Second Person.	
Nominative Case,	I	we	thou	you, ye
Objective Case,	me	us	thee	you, ye
Possessive Case,	my, mine	our ours	thy, thine	your, yours
	Third Person.			
Nominative Case,	he	she	it	them
Objective Case,	him	her	it	they
Possessive Case,	his	her, hers	its	their, theirs

The possessive cases of these pronouns are sometimes spoken of as a class by themselves, and called *possessive (adjective) pronouns.* In the first and second persons, the possessive cases, and in the third person, the objective cases, with *self* or *selves* affixed, constitute the *reflexive* pronouns. Ex. Know *thyself,* he loves *himself,* they were ashamed of *themselves.* And these and the possessives are rendered *emphatic* by the insertion of *own.* Ex. "I scarcely coveted what was *my own;*" "Thou owest unto me even *thine own self.*"

THE DEMONSTRATIVE PRONOUNS are *this* and *that,* with the plurals *these* and *those; such, the same, yon* and *yonder, here, there, hence, thence, then, etc.,* most of which are adverbs, used instead of a pronominal clause understood. Ex. "*This same* shall comfort us," "after *this* or *that* determinate manner," "it makes a greater show in *these* months than in *those,*" "*such* are the cold Riphean racé, and *such* the savage Scythian," "darkness *there* might well seem twilight *here,*" "*now* shaves with level wing the deep, *then* soars," "useless and *thence* ridiculous," "*yon* flowering arbors, *yonder* alleys green." *The,* commonly called the definite article, is properly a demonstrative pronoun.

INTERROGATIVE AND RELATIVE PRONOUNS.—Pronouns used in questions, called *interrogative,* and those used in subjective and adjective accessory sentences, called *relative,* are *who* (in the objective *whom,* and the possessive *whose,* in both numbers), *which* (occasionally with a possessive case, *whose*) *what, where, whither, whence, when, how;* some of them being adverbs. Ex. *Who* art thou? *Which* is it? *What* do you mean? "*Whose* dog are you?" "*Whom* dost thou serve?" *Whence* come you? "*Whither* goest thou?" "*How* can these things be?" "The son of Duncan, from *whom* the tyrant holds the due of birth, lives in the English court." "The handsel or earnest of that *which* is to come." "See *what* natures accompany the several colors." "In Lydia born, *where* plenteous harvests the fat fields adorn." "Grateful t'acknowledge *whence* his good descends." "I strayed I knew not *whither.*" *Note,* that the relative pronoun *what* is in signification equivalent to *the, that,* or *those which.*

Whoever, whosoever (and *whomsoever, whosesoever*) *whichever, whichsoever, whatever, whatsoever, wherever, whencesoever, however, herein, therein, therefore, wherefore, whereof, whereas, etc.,* are compounded or contracted pronouns and pronominal phrases, and are used somewhat in the sense of *relative pronouns.* Ex. "I think myself beholden, *whoever* shows me my mistakes." "*Whomsoever* else they visit, with the diligent only do they stay." "In *whatsoever* shape he lurk, I'll know." "Thy very stones prate of my *whereabout.*"

"You do take the means *whereby* I live." "*Herein* is a wonderful thing." "*Howbeit*, this wisdom saved them not."

INDEFINITE PRONOUNS.—In addition to these various classes of pronouns, there are some which are called *indefinite*, such as *one, aught, naught*, (sometimes spelt *ought, nought*), *each, every, either, neither, any, other* (which has a plural when used as a noun, but not when used attributively), *they* (when used to signify "people in general"), *etc.* Ex. "*One* may be little the wiser for reading," "for *aught* that I can understand," "it cometh to *naught*," "are there *any* with you?" "the virtue and force of *every* of these three is shrewdly allayed," "*they* say that he has died immensely rich."

ADVERBS.—These words do not admit of inflection, and of them some are found only in the adverbial form, others are used as prepositions or conjunctions also; some are pronouns or adjectives; and many are derived from adjectives and even from substantives.

They are employed to express the relations of place—as *here, there, where, hither, thither, whither, hence, thence, whence, above, below, before, behind, in, out, off, on, near, afar, backward, forward, aside, etc.*,—of time, as, *then, when, now, after, before, still, soon, already, lately, daily, hitherto, etc.*,—of manner, as *how, thus, so, as, otherwise, well, fluently, kindly, blindly, lovingly, bravely, brightly, etc.*,—of mood, as *yes, no, not, if, perhaps, probably, possibly, likely, really, etc.*,—of degree or intensity, as *frequently, seldom, often, again, very, quite, even, nearly, only, too, almost, much, rather, once, twice, thrice, etc.*,—of causality, as *wherefore, therefore, however, nevertheless, etc.*

Some of those of manner, degree, and mood admit of degrees of comparison, which they form after the manner of adjectives. Ex. *Soon, sooner, soonest, bravely, more bravely, most bravely.*

PREPOSITIONS.—These also are uninflected words, and besides the prepositions, properly so-called, nouns, adjectives, verbs, participles, and adverbs, and even combinations of words, are employed as prepositions. Almost all the real prepositions admit of being used to express every variety of relation between the predicate and its objects, and between a subject and its attributes; but originally they all expressed the relation of place alone.

The prepositions, properly so-called, and other words used for prepositions, are such as *above, about, across, after, against, along, among, at, before, behind, beside, between, beyond, by, concerning, down, during, from, in, into, of, off, on, over, save, since, through, till, to, toward, up, upon, with, etc.*

The following are some of the combinations of words used as prepositions:—*because of, by means of, on account of, in behalf of, instead of, according to, adjacent to, contrary to, with respect to, etc.*

Verbs are frequently compounded with prepositions to modify their signification; and sometimes prepositions are used as adverbial objects in our language which in other tongues are compounded with the verb. Ex. He *undertook* that business willingly; they have *overcome* their enemies; what would I not *undergo* for you? "they *went over* to the enemy;" "the poet *passes* it *over* as hastily as he can;" "to *set forth* great things by small;" "I shall *set out* for London to-morrow."

CONJUNCTIONS, like adverbs and prepositions, are indeclinable words. Some words are used only as conjunctions, and are called conjunctions proper; others are really pronouns, adverbs, etc.

Coördinative conjunctions are simply copulative, or serve to connect two clauses, or even two sentences, into a continuity of ideas. Such are *and, also, besides, moreover, too, not only—but also, both—and, as well as, neither—nor, then, etc.*; adversative, as, *else, either—or, not—but, on the contrary, still, nevertheless, etc.*; or causative, as, *therefore, hence, so, consequently, for, accordingly.* Subordinative conjunctions connect adverbial and subjective accessory sentences with their principal sentences; and are such as, *that, but that, but, whether, if, since, although, unless, so, when, while, whilst, where, whence, etc.*

ANCIENT FORMS.—Among these indeclinable classes of words may be found many very interesting examples of ancient forms and inflections of the English language, some of which have been lost in all but these instances, and in these the original signification is no longer preserved. Ex. Possessive cases, *else, unawares, needs*; dative cases, *seldom, whilom*; neuter objective cases, *little, less, well, nigh, athwart*; comparative degrees, *after, yonder, over, ere*; superlative degrees, *erst, next, almost.*

Indeclinable words, used only as adverbs, prepositions, conjunctions, and interjections, are frequently called *particles.* The direct affirmative, *yes*, and the direct negative, *no*, are by some grammarians placed in a distinct class, as not being properly adverbs.

SYNTAX

FORMATION OF SENTENCES.—Words are combined in the formation of sentences in three ways: as *subjects* and *predicates;* as *attributives* to subjects, and as *objects* to predicates. Sentences are combined *co-ordinately,* or *subordinately;* subordinate or accessory sentences occupying the positions of nouns, adjectives, or adverbs, in the principal sentences of which they form part.

SUBJECT AND PREDICATE.—In every sentence of perfectly expressed thought, two elements are positively essential: some person or thing spoken of, or a *subject;* and something asserted respecting it, or a *predicate.* If either subject or predicate be wanting, the expression in itself is unintelligible.

For subjects, nouns (which stand for persons or things) or pronouns (used in the place of nouns, and always in the nominative case), adjectives, participles or infinitive moods (representing qualities, actions, etc.), single words or letters (in which the thing and the name are identical), or *subjective accessory* sentences, may be used. Ex. "All *tongues* speak of him;" "*action* is eloquence;" "my *praises* made the first a soldier;" "*you* are a traitor;" "here *he* comes;" "*they* say, *she* 's mad;" "the *dead* shall rise and live again;" "the *wise* shall inherit glory;" "in him *sparing* would show a worse sin than its doctrine;" "*to err* is human, to *forgive,* divine;" "*who* is now used in relation to persons, and *which* to things"; "*A* has, in the English language, three different sounds." Examples of subjective accessory sentences are as follows: "*that you have wronged me,* doth appear in this;" "*for a holy person to be humble* is as hard as for a prince to submit himself to tutors;" "*to make such a statement* involves the suspicion of ignorance."

The strictly impersonal verbs have no subject expressed. Ex. "*Methinks* already I your tears survey," "*methought* I saw the grave where Laura lay." Actions or conditions which are not assignable to any subject, have the pronoun *it,* as a formal subject. Ex. "*It* thunders, *it* lightens," "*it* snows at the top of them, oftener than *it* rains," "*it* was freezing," "*it* is very cold," "*it* is hot to-day," "*it* seems." And similarly, for the sake of emphasis or animation, *it* and *there* are used formally as subjects, the real subjects being placed after their predicates. Ex. "*It* is excellent *to have a giant's strength,* but *it* is tyrannous *to use it as a giant,*" "*it* is good *to be here,*" "*it* is *I,*" "it was *you* who did this," "*it* behooved him *to suffer,*" "*it* is said *that parliament is dissolved,*" "*it* repented the Lord *that he had made man,*" "*it* doth not yet appear *what we shall be,*" "*there* be *many that say,*" "*there* was in a city *a judge,*" "once upon a time *there* lived *a man,*" "*there* arose *a mighty famine* in that land," "*there* were *that thought it a part of Christian charity to instruct them.*"

PREDICATE CONSTRUCTIONS.—The essential characteristic of the predicate being assertion, a verb is indispensable in this part of a sentence. But besides verbs of all kinds, the verb *to be,* with nouns or pronouns (and that not only in the nominative case, but in the possessive also, and in the objective with a preposition), adjectives, participles, the infinitive mood, adverbs (and adverbs with prepositions), single words or letters, and accessory sentences, may be used as predicates. In the latter cases, the form of the verb *to be,* which is employed, is called the copula, or link, which unites the predicate to the subject. Ex. "He *ran* this way, and *leaped* this orchard wall," "he *hath hid* himself among those trees," "I *'ll believe* thee," "Juliet *is the sun,*" "I *am a villain,*" "you *'ll be the bear,*" "her mother *is the lady of the house,*" "ye *are Christ's,* and Christ *is God's,*" "oh, he *is* even *in my mistress's case,* just *in her case,*" "the haughty prelate, with many more confederates, *are in arms,*" "*of noble race was* Shenkin," "they *were to the number of three hundred horse,*" "they *shall be mine,*" "you *shall be ours,*" "he *is not of us,*" "the sky *is red,*" "you *are meek,*" "you *are excused,*" "they *are running* this way," "you *are not to be taught,*" "the holy treasure *was to be reserved,*" "the woman *will be out,*" "ye *are from beneath,*" "the preterit of creep is *crept,*" "the ending of the genitive case *is s,*" "this *is what I said,*" "thou *art whom I fear,*" "men *should be what they seem.*" Nevertheless, in poetry and oratory, when peculiar emphasis or effect is desired, the copula is omitted, and the other predicative word placed before the subject. Ex. "*Vain, all in vain, the weary search;*" "*sweet the moments, rich in blessing.*"

The connection between the predicate and the subject in a sentence is shown by the predicate being in the same number as the subject. Ex. *He loves, they love,* the *tree falls, trees grow, I am* afraid, *we are* satisfied. Two or more singular subjects connected by the conjunction "*and*" (which, however, is often omitted), so as to form

either a compound or a single subject, have their predicate in the plural. Ex. *"Bacon and Shakespeare are* the greatest geniuses that England has produced;" "now *abide faith, hope, charity;*" *"one and one are* two." And similarly, collective nouns have their predicates in the singular when they are thought of in the aggregate, but the plural when their component parts are most regarded. Ex. *"Parliament is* sitting," *"a cluster* of mob *were* making themselves merry with their betters," *"the people are* the city," "my *people doth* not consider." But when the predicate is a singular noun, the copula is often singular. Ex. *"Bread and cheese is* fit diet for a prince." And when the conjunction *or* or *nor* is used, unless the last subject be plural, the predicate is singular. Ex. "Either *you or your brother has* deceived me," *"neither shall the sun* light on them, *nor any heat,*" "either *he or they have* carried her off."

Assertions Regarding One's Self.—When the speaker makes the assertion respecting himself, the subject is a personal pronoun of the first person, and the verb is also in the first person; when the assertion is addressed to him respecting whom it is made, the personal pronoun of the second person, and the form of the verb to correspond with it, are employed; and when it relates to any other person or thing, the third person of the verb (with the pronoun to correspond, if requisite), is used. Ex. *"I,* that *speak* unto thee, *am* he," *"I know* in whom *I have* believed," *"we speak* that *we do know,"* *"thou art* the man," *"thou knewest* that I was an austere man," *"ye believe* not, because *ye are* not of my sheep." "Hamlet, *thou hast* thy father much *offended.*—Mother, *you have* my father much *offended."* *"He planteth* an ash, and the *rain doth nourish* it," *"he drinketh* no water, and *is* faint," "the great *duke came* to the bar," "gentlemen, the *penance lies* on you," "heavenly *blessings follow* such creatures," "the *hearts* of princes *kiss* obedience, so much *they love* it." In commands, the subject is very commonly omitted. Ex. *"Observe, observe,* he is moody," *"believe* it, this is true," "pray *hear* me." The subject is also very frequently omitted in animated discourse, before the verbs *pray, please, etc.,* when used in accessory sentences. Ex. *"Pray* hear me," "give it me, *please.*"

General Assertions.—When the assertion is general, or refers to the time at which it is made generally, the present indefinite tense is used. Ex. "Man *wants* but little here below." "I *am* the most unhappy woman living." "My lords, you *speak* your pleasures. What he *deserves* of you and me, I *know;* what we *can do* to him (though now the time *gives* way to us) I much *fear.*" When it refers to the actual point of time at which the assertion is made, the present imperfect is used. Ex. "The duke *is coming,*" "his grace *is entering,*" "from all parts they *are coming,*" "England *is* not *wanting* in a learned nobility." And when it is made respecting an action regarded at the time as completed, the present perfect is employed. Ex. *"I have heard* one of the greatest geniuses this age *has produced,*" "the gods *have placed* labor before interest," "this observation *we have made* on man." The present perfect sometimes appears with a different auxiliary. Ex. *"I am come, they are gone."* "Cardinal Campeius *is stolen* away to Rome." The indefinite tense is frequently used instead of the imperfect. Ex. "He *bites* his lip, and *starts, stops* on a sudden, *looks* upon the ground." And the present perfect is sometimes employed to indicate past time, or in a sense equivalent to that of the past indefinite tense. Ex. "We *have done* that which it was our duty to do," "we *have heard* with our ears, and our fathers *have declared* unto us the noble works thou didst in their days."

Peculiar Uses of the Present.—In animated historical narrative, and in narrative poetry, the present indefinite is often employed. Ex. "The boy *starts* to his feet, and his keen eye *looks* along the ready rifle .... Lo! a deer from Dalness, hound-driven, or sullenly astray, slowing, bearing his antlers up the glen, then stopping for a moment to snuff the air, then away—away! The rifle-shot *rings* dully from the scarce echoing snow-cliff, and the animal *leaps* aloft struck by a certain but not sudden death-wound."

Her lover *sinks*—she *sheds* no ill-timed tears;
Her chief *is slain*—she *fills* his fatal post;
Her fellows *flee*—she *checks* their base career;
Her foe *retires*—she *heads* the sallying host.

"My General *descends* to the outer staircase, and *harangues;* once more in vain . . . Lafayette *mounts* the white charger; and again *harangues,* and *reharangues,* . . . so *lasts* it, hour after hour, for the space of half a day."

Constructions with Past Tenses.—In like manner, actions, etc., are referred to the past generally, or as proceeding and incomplete, or as completed, by the use of the past indefinite, imperfect, and perfect tenses. Ex. "My father *loved* you, *he said he did,*" *"I* thrice *presented* him a kingly

crown," *"you wronged* yourself;"—"they of Bethshemesh *were reaping,"* "Israel *were fighting* with the Philistines," "they *were eating,* and *drinking,* and *dancing;"*—"when Boaz *had eaten* and *drunk,* he went to lie down," "Elihu *had waited* till Job *had spoken."* The emphatic form is commonly used interchangeably with the indefinite. Ex. "Thus *did* my master *bid* me kneel, and thus *he bade* me say." The indefinite is often employed definitely when any particular past time is indicated in the sentence. Ex. *"I saw* him *yesterday."*

Uses of the Future Tense.—And in the same way actions, etc., in time become discriminated by the employment of the future indefinite, imperfect, and perfect tenses. Ex. "A weighty secret *will work* a hole through them," "he *will* not *stoop* till he falls," "I *shall* never *forget;"*—"thy people *shall be willing* in the day of thy power," "they *will* be still *praising* thee;"—"we *shall have completed* our task before you commence yours," "then cometh the end, when *he shall have delivered* up the kingdom to God." Instead of the future, the indefinite present is often used. Ex. *I leave* England to-morrow, *we sail* next week. Other forms for expressing future time are mentioned above. Ex. *"We are going to spend* some time on the Continent," *"I was about to write."*

The Indicative Mood.—When simple assertion, or denial, is intended, the predicate is always in the indicative mood. Ex. *"I am glad* to see your lordship abroad," "the mouse *gnawed* the threads to pieces, and *set* the lion at liberty," "he *goeth* in company with the workers of iniquity, and *walketh* with wicked men," *"you did wish* that I would wake her then," *"she may go* to bed when she list; *all is* as she will," *"thou must run* to him," *"flatter him it may, I confess."*

The Subjunctive Mood.—In principal sentences, when a wish is to be expressed, or a concession to be made for the sake of argument, the subjunctive mood is used. Ex. "Now, all my joy *trace* the conjunction!" "the Lord *forbid!"* "the Lord *increase* this business!" *"be it so,* my argument remains unshaken."

Commands are conveyed by means of the imperative mood. Ex. *"Know* thyself," *"follow thou* me," *"cease* to do evil, *learn* to do well," *"rejoice,* you men of Angiers, *ring* your bells." The auxiliary *let* is employed for the first and third persons. Ex. "Acknowledge then the king, and *let me in,"* *"let* none of them *escape,"* "rise, *let us go,"* *"let* the soldiers *seize* him," *"let* Euclid *rest,* and Archimedes *pause,"* *"let him be known* among the heathens."

Active and Passive Voices.—The distinction between the use of the active and the passive forms of verbs has been pointed out and illustrated above (p. 11); and from that it will appear that whatever has been said here respecting predicates applies as much to the latter as to the former, with this exception—there being no (or but few) imperfect tenses in the passive, the indefinite tenses are in all cases (except the few referred to) used to express action still in progress, or incomplete. Ex. "The colors *are changed* by viewing them at different obliquities," *"I am determined* to prove a villain," *"you shall be* new *christened* in the town," "to that sweet region *was* our voyage *bent,"* "Hector *was dragged* about the walls of Troy," "the Irish horse-boys *should be cut off,"* "after all that *can be said* against it, this remains true," *"it may be occasioned* thus," *"it shall be reported* to the king," "the Presbyterian sect *was established* in all its forms," *"it was said,* that the elder should serve the younger."

Interrogative Sentences.—In questions the same grammatical forms are employed as in assertions; but the order of the words is generally inverted, and when compound tenses are used (as they most frequently are), the subject follows the auxiliary, while the verb itself occupies its usual place. Interrogative pronouns are put at the beginning of questions. Ex. *"Where is he?" "Shall I live* in hope?" *"What, do you tremble, are you* all afraid?" *"Saw you* the king to-day?" *"When have I injured* thee?" *"Why look you* so pale?" *"Who hath believed* our report?" *"To whom will ye liken* God?" "Lusentio *is your name?"* "What, *you mean* my face?" *"You saw* this and *opposed* it not?"

The grammatical construction of negative sentences differs not at all from that of affirmative ones, such as have been chiefly selected for examples; the relation of the negative words *no, not,* etc., being either that of the attributive to its subject, or of the object of manner to its predicate, as may be seen below.

Subject and Attributive.—In order to describe the subjects respecting which assertions are made in sentences, more accurately than their mere names are sufficient to do; and to define them, so that the assertions may not become ambiguous by reason of the vagueness of the subjects they

relate to, words, phrases, and accessory sentences are employed, which are called attributives.

The commonest attributives are adjectives; with which may be included participles (which are the adjective forms of verbs), numerals, some kinds of pronouns, nouns used as adjectives, and a few adverbs, which are also occasionally used attributively. The only sign of the relation between these attributives and their subjects is their position, which is immediately before the words they refer to, except in cases where peculiar emphasis or animation is aimed at, when they immediately follow their subjects. Ex. "*The weird* sisters," "*my dread* exploits," "from *this* moment," "*my dearest* coz," "*my pretty* cousin," "to offer up a *weak, poor, innocent lamb*," "O nation *miserable!*" "*a most miraculous* work in *this good king*," "*thy royal* father was a *more sainted king*," "*each several* crime," "*many* ways," "*the healing* benediction," "*all my pretty* chickens," "*an accustomed* action," "curses, not *loud*, but *deep*," "*those linen* cheeks of thine are counsellors to fear," "*a rooted* sorrow," "*the written* troubles of the brain," "*what* wood is this?" "within *this three* mile," "*a moving* grove," "lead *our first* battle," "hateful to *mine* ear," "thou shalt have *none* assurance of *thy* life," "there was *no* day like that before," "it is *no good* report that I hear," "in *that very* day his thoughts perish," "*a hundred* altars in *her* temples smoke, *a thousand* bleeding hearts *her* power invoke," "*some* men with swords may reap the field," "see where *the victor* victim bleeds," "*his* knowledge of good *lost*," "man's *first* disobedience," "these are *the martyr* spirits of mankind," "*which* way went he?" "*what* man is he?" "on the *hither* side," "*yon flowery* arbors, *yonder* alleys *green*," "in *russet* gear and *honest kersey* hose," "a hundred upon *poor four* us!" "*an everlasting* now."

In some cases where a noun is compounded with an attributive word, in the plural number, the noun assumes the plural form. Ex. Attorney-general, *Attorneys*-general; Lord-lieutenant, *Lords*-lieutenant. But where the compound word expresses an inseparable notion the plural ending is added to the attributive, if that is the second element in the word. Ex. Two *spoonfuls*.

Possessives as Attributives.—Nouns and pronouns in the possessive case are exceedingly common as attributives. But it must be noted that there is no distinction between the possessive cases of personal pronoun and certain adjective pronouns called possessive; examples of which are given in the preceding paragraphs. Sometimes the subject to these attributives is omitted; and frequently the preposition *of* is inserted before the possessive case. Ex. "I am not yet of *Percy's* mind," "the roaring of the *lion's* whelp," "a *herald's* coat without sleeves," "hearts no bigger than *pins'* heads," "I did pluck allegiance from *men's* hearts," "a fair queen in a *summer's* bower," "I must to the *barber's*, monsieur," "the knight came to the *tailor's*," "I saw thee late at the Count *Orsino's*," "which is the way to Master *Jew's?*" "let *ours* also learn to maintain good works," "I seek not *yours* but you," "the king is now in progress towards *St. Alban's*," "a friend *of mine* on his journey," "if e'er those eyes *of yours* behold another day," "a seal ring *of* my *grandfather's*," "this dotage *of* our *general's* o'erflows the measure."

Objectives as Attributes.—The objective case of nouns and pronouns, with various prepositions, but especially with the preposition *of* (which combination is equivalent to the possessive case), is used attributively. Ex. "I speak in behalf *of* my *daughter*, in the minority *of them* both," "the wicked ministry *of arms*," "the instrument *of Providence*," "the customs *of* the *Irish*," "thou art a soul *in bliss*," "a wholesome law time *out of mind*," "compassion *on* the *king* commands me stoop," "travels *by sea* and *land*," "the messenger *from* our *sister*," "our duty *to God*," "sons *to Cymbeline*," "four rogues *in buckram*." Imperfect participles are also employed with the preposition *of* as attributives. Ex. "A famine *of hearing* the word of the Lord," "he hath a bad habit *of frowning*," "the greatest care *of fulfilling* the Divine will." Another attributive use of this preposition (with one or two others) with nouns and pronouns is called partitive, from its evident force and signification. Ex. "The most diminutive *of birds*," "I have peppered two *of them*," "seven *of* the *eleven*, I paid," "every one *of them*," "all *of us*," "it contained the whole *of religion*," "for which *of* these *works* do ye stone me?" "one *amongst a thousand*."

Apposition.—Subjects are further defined and described by means of the words expressing subjects, in the same number, and immediately preceding or following them, and said to be in apposition with them. Ex. "Fulvia thy *wife* came first into the field, against my *brother* Lucius," "the

false *house-wife* Fortune," "thou, my *brother,* my *competitor,* my *mate* in empire, *friend* and *companion* in the part of war," "*King* Cophetua wooed the *beggar* maid," "Hamlet, *Prince* of Denmark," His royal *highness, Prince* Albert; *Lord John* Russell, *Mr.* Smith. When several persons of the same name are spoken of, or addressed by letter, the honorary title is put in the plural, while the name is in the singular number. Ex. *Messieurs* Smith, Cheeryble *Brothers, the Mesdames* Robinson.

In some cases the noun in apposition is connected by means of the preposition *of.* Ex. The empire *of Russia,* the city *of St. Petersburg,* the university *of Cambridge,* the county *of Kent,* the port *of London,* the month *of July,* the province *of Judea.*

When two nouns in apposition are attributives to another, the latter only is put in the possessive case. Ex. "Our *neighbor Shepherd's* son," "King *Henry's* head," "*Dr. Johnson's* Dictionary," "*Duke Humphrey's* deeds," "The *Lord Protector's* wife," "my *Lord Cardinal's* man," "*Saint Alban's* shrine."

Accessory sentences are employed as attributives. Ex. "Whose hand is *that the forest bear doth lick?* Not his *that spoils her young before her face,*" "a day will come, *when York shall claim his own,*" "in that chair, *where kings and queens are crowned.*"

ATTRIBUTIVE CONSTRUCTIONS.—Many of the illustrations given above show how common it is for a single subject to be described and defined by means of many attributives. The following examples will show some of the ways in which the repetition of the same word as subject to several attributives, or as attributive to several subjects, is prevented. Ex. "I thought the king had more affected *the Duke of Albany* than *Cornwall,*" "the *princes, France* and *Burgundy,*" "here I disclaim all . . . *propinquity* and *property of blood,* and as *a stranger to my heart* and *me,* hold thee," "we still retain the *name* and all the *additions to a king,*" "thy dowerless daughter is *queen of us, of ours,* and *our fair France,*" "he wrote this but as *an essay* or *taste of my virtue;*" "*menaces* and *maledictions against king* and *nobles;*" "the *marks of sovereignty, knowledge,* and *reason;*" "my train are *men of choice* and *rarest parts;*" "*the messengers from our sister* and *the king;*" "he, *the* sacred *honor of himself, his queen's, his* hopeful *son's, his babe's* betrays to slander;" "*uncles of Glo'ster* and *of Winchester;*" "the Dukes *of Orleans, Calaber, Bretaigne,* and *Alençon.*"

PREDICATE AND OBJECT.—The signification of predicates is modified or completed by means of words, phrases, and accessory sentences, which are called objects. And not only are all parts of verbs followed by these adjuncts, but adjectives also frequently require them.

Objects which complete or supplement the meaning of their predicates are of three kinds:—(1.) The immediate or direct object of the predicate; (2.) the remoter, or mediate and indirect object; (3.) the remotest object, or that which indicates the effect or result of what is asserted in the predicate. Ex:

	1st obj.	2d obj.	3d obj.
"I will take	*you*	*to me*	*for a people.*"
	2d obj.	1st obj.	3d obj.

"This opinion gave *them courage to all adventures.*"

Those which modify or attemper the signification of their predicates are six in number:—(1.) Those which indicate the cause or origin of whatever is asserted in the predicate; (2.) those which tell its design or purpose; (3.) those which declare the means by which it is brought about; (4.) those which show the manner of its existence or action; (5.) and (6.) those indicating the time and place of its occurrence. It must, however, be observed, that it is not easy in all instances to determine to which class an object belongs—those expressing cause, purpose, or means frequently being distinguishable by exceedingly evanescent characteristics. But this is not, practically, either inconvenient or productive of ambiguity; as may be seen in the examples of these and other kinds of objects. Ex. (1.) "My soul grows sad *with troubles;*" "*by that sin* fell the angels." (2.) "She went *to glean Palæmon's fields;*" "one man pursues power *in order to wealth,* and another wealth *in order to power.*" (3). "Judge the event *by what has passed;*" "the strong *through pleasure* falls soonest." (4.) "They act *wisely;*" "beware and govern *well* thy appetite." (5.) "We lacked your counsel and your help *to-night;*" "it hath been sung *at festivals, on ember eves,* and *holy ales.*" (6.) "The lion's foe lies prostrate on *the plain;*" "I am *with thee, by* and *before, about* and *in thee,* too."

Nouns, pronouns, and other words used as nouns,—such as the infinitive mood of verbs, and participles,—most commonly without, but also with prepositions before them, serve as immediate objects of predicates; and also of the infinitive mood of

verbs, and participles, and of adjectives, when they are not the predicates of sentences. And the personal pronouns, whether with or without prepositions, are in the objective case. Ex. "Do you not hear *him?*" "you mar our *labor;*" "keep your *cabins;*" "you do assist the *storm;*" "'t is time I should inform *thee* further;" "wipe thou thine *eyes;* have *comfort;*" "you have often begun to tell *me* what I am, but stopped, and left *me* to a bootless inquisition;" "he *whom,* next thyself, of all the world I loved, and to him put the *manage* of my state;" "the *government* I cast upon my brother;" "the ivy which had hid my princely *trunk,* and sucked the *verdure* out on't;" "triumphing *over death,* and *chance,* and *time;*" "*on* mine *arm* shall they trust;" victorious *over temptation.*"

The common exclamations, "ah *me!*" and "*woe* is *me!*" are contractions; the latter was originally, "woe *becomes* or *befits me,*" and the former is equivalent to it in meaning, and may have been derived from it.

The More Remote Object is also expressed by nouns, and most commonly preceded by the preposition *to;* but this is often omitted; and there are other prepositions which serve to connect this object with its predicate. Whenever the remoter object is expressed, but the immediate object left out, the sense is imperfect. The personal pronouns, as in the last, are always in the objective case. Ex. "Three great ones of the city oft capp'd *to him;*" "whip *me* such honest knaves;" "throwing but shows of service *on their lords,* do *themselves* homage;" "I am beholden *to you;*" "forgive *us* our trespasses;" "he makes a supper, and a great one, *to many lords and ladies;*" "I need not add more fuel *to your fire;*" "comparing spiritual things *with spiritual;*" "I have charged *thee* not to haunt about my doors;" "fetch *me* an iron crow;" "O continue thy loving-kindness *unto me;*" "the services, which I have done *the signiory;*" "the goodness of the night *upon you, friends;*" "I'll refer me *to all things of sense;*" "good-night *to every one!*" "it can not be that Desdemona should long continue her love *to the Moor,* nor he his *to her;*" "I have told *thee* often, and I re-tell *thee* again and again, I hate the Moor."

For the Remotest Object, which expresses the result or effect of the predicate, nouns (with or without prepositions, or preceded by the conjunction *as*), pronouns, adjectives, participles, the infinitive mood of verbs, and *to be* with nouns, adjectives, and adverbs, are employed. Ex. "He, in good time, must *his lieutenant* be, and I, *his Moorship's ancient;*" "the king, your father, was reputed *for a prince most prudent;*" "whom I hold *my most malicious foe,* and think *not at all a friend to truth;* bade me *enjoy it;*" "man became *a living soul;*" "why should damage grow *to the hurt of the king?*" "they looked upon themselves *as the happiest people of the universe;*" "things were just ripe *for a war;*" "those pearls of dew she wears prove *to be presaging tears;*" "his servants ye are to whom ye obey, whether of sin *unto death,* or of obedience *unto righteousness;*" "we take a falling meteor *for a star;*" "it were not *for your quiet, nor your good, nor for my manhood, honesty, and wisdom,* to let you know my thoughts;" "I believe him *to be a very honest man;*" "*whom* do you suppose it *to be?*"

Objects Modifying Meaning.—Of the objects which modify the meaning of the predicate, those which do so by indicating its origin or cause are expressed by nouns (and all words and combinations of words that can be used instead of them), preceded by certain prepositions, and by some adverbs. Oaths are included under this head, as indicating the ground of the assertion, though not of what is asserted. Ex. "I would not follow him *then;*" "*therefore* to our best mercy give yourselves;" "whom *from the flow of gall* I name not, but *from sincere motions;*" "you lost your office *on the complaint of the tenants;*" "men are pleased *with variety;*" "astonished *at the voice,* he stood;" "they were jealous *of her beauty;*" "guilty *of high treason;*" "I can tell you *why;*" "thou hast forced me *out of thy honest truth* to play the woman;" "they boast themselves *of idols;*" "Sempronius gives no thanks *on this account;*" "you are good, but *from a nobler cause, from your own knowledge, not from nature's laws;*" "*by the faith of a man,* I know my prince;" "*by heaven,* I rather would have been his hangman;" "*on my honor,* it is so."

Objects Indicating Design.—Those objects which point out the design and purpose of the predicate are expressed by the infinitive mood of verbs, most commonly, and also by nouns, etc., with prepositions. Ex. "I follow him *to serve my turn upon him;*" "wears out his time *for nought but provender;*" "in following him, I follow but myself, *not* I *for love and duty,* but

seeming so, *for my peculiar end;*" "I come *to bury Cæsar, not to praise him;*" "he travelled the world, *on purpose to converse with the most learned men;*" "*with this design* I have visited all the most celebrated schools in Europe;" "he writes *not for money nor for praise;*" "there is a time *to weep,* and a time *to laugh;*" "be swift *to hear,* slow *to speak;*" "one man pursues power *in order to wealth,* and another wealth *in order to power;*" "thou art not able to go against this Philistine *to fight with him.*"

OBJECTS INDICATING MEANS.—Objects by which the means employed in producing any result are declared are generally expressed by nouns, etc., with prepositions. Ex. "I must be be-lee'd and calm'd *by debtor and creditor, this countercaster;*" "preferment goes *by letter and affection, not by the old gradation;*" "plague him *with flies;*" "we may outrun *by violent swiftness* that which we run at, and lose *by overrunning;*" "my soul grows sad *with troubles;*" "the strong *through pleasure* soonest falls, the weak *through smart;*" "you must think we hope to gain *by you;*" "thus, *by the music* we may know when noble wits a-hunting go;" "you absolved him *with an axe;*" "some he killed *with his gun,* others *by poison.*"

MANNER is expressed by adjectives, participles, adverbs, and nouns, etc., with prepositions or the conjunction *as.* Ex. "He, *as loving his own pride and purposes,* evades them, *with a bombast circumstance;*" "wears out his time, *much like his master's ass;*" "*wide* was spread their fame in ages past;" "*in madness, being full of supper and distempering draughts,* dost thou come to start my quiet;" "he, *with his father,* is going home;" "a Puritan among them sings psalms *to hornpipes;*" "we are not to stay *all together,* but to come by him, where he stands, *by ones, by twos, and by threes;*" "seize her *by force,* and bear her hence *unheard;*" "*so* frown'd the mighty combatants;" "*thus* he spake;" "quit yourselves *like men;*" "ye shall be *as gods;*" "come *quickly;*" "he answered *well;*" "they that sow *in tears* shall reap *in joy;*" he that goeth forth *weeping, bearing precious seed,* shall doubtless come again *with rejoicing, bringing his sheaves with him;*" "they act *wisely.*"

OBJECTS INDICATING TIME.—All the various ways in which objects indicate the time of an action, etc., are expressed by nouns, etc., with or without prepositions, adjectives, participles, and adverbs. Ex. "He *in good time* must his lieutenant be;" "we rose both *at an instant,* and fought *a long hour by Shrewsbury clock;*" "then have sat *the livelong day;*" "he came *by night;*" "doomed *for a certain time* to walk the night, and *for the day* confined to fast in fires;" "he did them meditate *all his life long;*" "*till then,* who knew the force of those dire arms?" "I have not wept *this forty years;*" "*morning by morning* shall it pass over;" "yet in her sanguine gown *by night and day;*" "depart *immediately;*" "I was *never* pleased;" "thy servants' trade hath been about cattle *from our youth even until now;*" "*sometimes* walking;" "*now* is the time."

PLACE WHERE, AND DIRECTION whence and whither, are expressed by nouns, etc., with or without prepositions, and by adverbs. Ex. "I will wear my heart *upon my sleeve;*" "his eyes had seen the proof *at Rhodes, at Cyprus, and on other grounds;*" "proclaim him *in the streets;*" "I, *upon my frontiers here,* keep residence;" "I saw *hereabout* nothing remarkable;" "let them *hence away;*" "a puissant and mighty power is marching *hitherward* in proud array;" "if they come to sojourn *at my house,* I'll not be there;" "darkness *there* might well seem twilight *here;*" "ah! *where* was Eloise?" "the good man is gone *a long journey;*" "come *a little nearer this way;*" "the eyes of the Lord are *in every place;*" "we must measure *twenty miles* to-day;" "he looked *this way and that way;*" "come *hither,* child, *to me.*"

ACCESSORY SENTENCES are sentences complete in themselves as to syntax, but occupying subordinate places in other sentences, which stand to them in the relation of principals. They are of three kinds, named (after the offices they discharge in their principal sentences) subjective, attributive, and objective sentences. Their relation to their principals is shown by their position, and by the use of relative pronouns and certain conjunctions, and in many cases by the employment of the subjunctive mood.

SUBJECTIVE ACCESSORY SENTENCES are found in every relation in which a noun could stand; and may be either subjects, predicates (both of which have been illustrated above), or completing objects to predicates (with or without prepositions); but being equivalent to nouns, they are named after that part of the sentence which is especially taken by the noun. Ex. "See *that thou do it;*" "I take *it* much unkindly, *that thou, Iago, shouldst know of this;*" "thou toldst me, *thou didst hold him in*

thy hate;" "be judge yourself, *whether I in any just term am affined to love the Moor;*" "right glad I am, *he was not in this fray;*" "I have forgot *why I did call thee back;*" "*what you would work me to* I have some aim;" "mark me *with what violence she loved the Moor;*" "I could well wish *courtesy would invent some other custom of entertainment;*" "you must not think, then, *that I am drunk;*" "*what you can make her do,* I am content to look on; *what to speak,* I am content to hear;" "mark *what it is his mind aims at in the question, and not what words he expresses;*" "she said, *Say on;*" "as when we say, *Plato was no fool.*"

ATTRIBUTIVE ACCESSORY SENTENCES occur wherever adjectives might be used as attributives. The relation between these sentences and their subjects is shown by their position, by their predicates assuming the same personal forms as those of their subjects, and by the employment of the relative pronouns *who, which,* and *that,* in them. Where no confusion is possible, these pronouns may be omitted. Ex. "*Thou, Iago, who hast had my purse;*" "*a fellow that never set a squadron in the field, nor the division of a battle, knows more than a spinster;*" "I hold *him* to be unworthy of his place *that does those things;*" "I fear the *trust Othello puts him in* will shake this island;" "honest *Iago, that lookst dead with grieving;*" "*every one* hears that, *which can distinguish sound;*" "that forbidden *tree, whose mortal taste brought death into the world;*" "the *son* of Duncan, *from whom this tyrant holds the due of birth;*" "*fruits that blossom first,* will first be ripe;" "*he that is of God,* heareth *God's words;*" "unto *me, who am less than the least of all saints;*" "thinkest thou this, O man, *that judgest them which do such things, and dost the same,* that thou shalt escape the judgment of God?" "*I, that speak unto thee,* am he."

Whether the relative be subject attributive, or object, in its own sentence, it is always placed at the very commencement of it, because it has so few inflections, that otherwise its connection with the subject (or antecedent) it refers to might be obscure.

These sentences frequently stand as attributives to other sentences, which are related to them as subjects. Ex. "They shall obey, unless they seek for hatred at my hands, *which if they do,* they shall feel the vengeance of my wrath;" "he was unsatisfied in getting, *which was a sin;*" "as he spoke, a braying ass did sing most loud and clear, *whereat his horse did start.*"

OBJECTIVE ACCESSORY SENTENCES are those which serve instead of objects of cause, purpose, means, manner (including degree or intensity), time, and place; and those expressing a condition or concession, which are distinguished by the employment of the probable or improbable forms of the subjunctive mood, according to the amount of contingency affecting the condition or concession, and generally after certain conjunctions. The indicative mood is, however, now very commonly used instead; always, indeed, where no contingency or uncertainty is to be expressed. Ex. "*Because we come to do you service,* you think we are ruffians;" "*since neither love, nor sense of pain, nor force of reason can persuade,* then let example be obeyed;" "be ye steadfast, immovable, . . *forasmuch as ye know that your labor is not in vain in the Lord;*" "he makes it his care both to write and to speak plainly, *so that he may be understood;*" "treat it kindly, *that it may wish, at least, with us to stay;*" "judge not, *that ye be not judged;*" "as will appear *by what follows;*" "*from what has been said,* you may perceive the hopelessness of your undertaking;" "be taught *by what I am suffering;*" "who, *he knew,* would be willing;" "thou hast used my purse, *as if the strings were thine;*" "it is *as* sure *as you are Roderigo;*" "throw *such* changes of vexation on't, *as it may lose some color;*" "*the longer I am acquainted with him,* the *more* I like him;" "*so great* was the cold, *that the deepest rivers were frozen;*" "he is *as* merry *as the day is long;*" "I'll see, *before I doubt;*" "kings may take their advantage, *when and how they list;*" "use physic, *or ever thou be sick;*" "*while I was protector,* pity was all the fault that was in me;" "he is the most improved mind, *since you saw him,* that ever was;" "*where your treasure is,* there will your heart be also;" "I will follow thee *whithersoever thou goest;*" "I have shown *whence the understanding may get all the ideas it has;*" "the noise pursues me, *wheresoe'er I go;*" "despise me, *if I do not;*" "*were I the Moor,* I would not be Iago;" "you will not serve God, *if the devil bid you!*" "*think we, or think we not,* time hurries on;" "thou dost conspire against thy friend, *if thou but thinkst him wronged, and makest his ear a stranger to thy thoughts;*" "*though thou detain me,* I will not eat;" "*wert thou an oracle to tell me so,* I'd not believe it;" "*had fate so pleased,* I had been eldest born;" "I had been hap-

by, so I had nothing known;" "unless I look on Sylvia in the day, there is no day for me to look upon;" *"though he was rich, yet* for our sakes he became poor;" "many things are believed, *although they be intricate, obscure, and dark."*

CONTRACTED AND COMPOUND SENTENCES.—Two or more sentences having the same subjects, or the same predicates or objects, and two or more subjects having the same attributives, or *vice versâ,* are frequently contracted into one compound sentence, or phrase, by the use of conjunctions. Examples of several kinds may be found in the former parts of this Compendium; others are such as these: Ex. "With fairest flowers, whilst summer lasts, *and* I live here, Fidele, I'll sweeten thy sad grave;" "his honesty got him small gains, but shameless flattery, *and* filthy beverage, *and* unseemly thrift, *and* borrow base, *and* some good lady's gift;" "it shall ever be my study to make discoveries of this nature in human life, *and* to settle the proper distinctions between the virtues *and* perfections of mankind, *and* those false colors *and* resemblances of them, that shine alike in the eyes of the vulgar."

In contracted sentences, where a comparison is expressed, care should be taken to avoid ambiguity. Ex. "He would make a better soldier *than scholar,"* expresses the greater aptitude of the person spoken of for the arts of war, than for the pursuit of learning. "He would make a better soldier *than a scholar,"* expresses that the person spoken of displays greater aptitude for war than a student would. "He likes them better *than I,"* signifies that his liking for the persons spoken of is greater than my liking for them; while "he likes them better *than me"* signifies that his liking for them is greater than his liking for me.

Similarly, wherever two or more subjects are distinguished by the attributive adjectives only, unless in cases where no ambiguity can arise, they should be distinguished by the repetition of the demonstrative. Ex. *"The red and blue* vestments were most admired," should be, *"the red and the blue* vestments," if two kinds are intended. But we may say, *"the Lords Spiritual and Temporal,* because the attributives are incompatible in their signification.

CONSTRUCTION is the arrangement of words in sentences, and of sentences in relation to each other, so as to indicate the subordination of the several parts, and their connection and union; and the universal rule is to place the subordinate words, or phrases, before the principal ones. Yet for the sake of imparting special significance to some words or sentences, the form of this rule is often violated, and particularly in poetry. This is called inverted construction, to distinguish it from the ordinary arrangement, which is designated direct.

DIRECT CONSTRUCTION.—"The orator had the honor of haranguing Pope Clement the Sixth, and the satisfaction of conversing with Petrarch, a congenial mind; but his aspiring hopes were chilled by disgrace and poverty; and the patriot was reduced to a single garment, and the charity of an hospital!" "The apartments, porticoes, and the courts of the Lateran were spread with innumerable tables for either sex, and every condition; a stream of wine flowed from the nostrils of Constantine's brazen horse; no complaint, except the scarcity of water, could be heard; and the licentiousness of the multitude was curbed by discipline and fear."

INVERTED CONSTRUCTION.—"At last, after much fatigue, through dull roads, and bad weather, we came, with no small difficulty, to our journey's end." "Unto the French, the dreadful judgment-day so dreadful will not be, as was his sight." "So shaken as we are, so wan with care, find we a time for frighted peace to pant." "Great is Diana of the Ephesians!" "Fallen, fallen is Babylon, that great city!" "Silver and gold have I none: but such as I have, give I unto thee." "Go I must, whatever may ensue." "Up rose the sun, and up rose Emily."

ACCENTUATION.—In order to show the subordination of the less important phrases in sentences, to the principal ones in each of the several combinations treated of above, and to give prominence to the most important elements in words, a particular stress of voice (called accent) is customarily laid upon the radical part of all inflected words, and upon the principal words or phrases in each of those combinations. Ex. Gólden, disgráceful, grátitude, kíngdom, trúthfulness, wákeful; they reád; the men were astónished, my suspicions were corréct; the secrets of the gráve this viperous slander enters; the míghty dead; áll his gólden words are spent; king David; here is one Lucianus, néphew to the king; the kíngdom of England; the world háteth you; I jóy to meet thee; give the book to mé; I cráve your pardon.

EMPHASIS is distinguished from accent by this: the latter serves to indicate the connection of the words, etc., and to give unity to the meanings of the several parts which enter into the different combinations that make up sentences, etc.; while emphasis shows some special meaning which the speaker desires to give to his words, and which they would not ordinarily bear. Ex. "Thé́y read, wé write, the mén were astonished, and the wóman fled; my suspícions were correct, but my knówledge was no more than yours; the kingdom of England, not that of Scótland; no, sir, I do not bite my thumb at yoú, sir; but I bite my thúmb, sir; be not afraid, shé shall not harm thee; I scorn you not, it seems that you scorn mé."

PUNCTUATION.—The pauses which, in speaking, are used to impart greater accuracy and clearness to our expressions, in writing are represented by characters called stops; and the notes of interrogation and admiration, the parenthesis and the dash, as well as the breaking up of composition into paragraphs, are employed for similar purposes. In poetry they are more used than in prose; and the fewest number possible should always be employed.

USES OF THE COMMON POINTS.—The full point, or *period*, indicates the termination of a passage which is complete both in meaning and in syntax. The *colon* marks the end of a grammatical combination, but shows that what follows is required to complete the meaning. The *semicolon* shows that, both in meaning and in syntax, the expression it follows is incomplete. The *comma* is used to distinguish, rather than to divide, the parts of grammatical combinations, so that the connection between them, and their signification when combined, may be more clear. But where the passages are not very long, and no mistake would arise, the comma is used for the semicolon, and even for the colon; and the semicolon is employed instead of the colon. The *period* is frequently employed, also, where we should expect only the colon. Ex. "The Roman Senators conspired against Julius Cæsar to kill him: that very next morning Artemidorus, Cæsar's friend, delivered him a paper (desiring him to peruse it), wherein the whole plot was discovered: but Cæsar complimented his life away, being so taken up to return the salutations of such people as met him in the way, that he pocketed the paper, among other petitions, as unconcerned therein; and so, going to the Senate-house, he was slain."

> "The noble Brutus
> Hath told you, Cæsar was ambitious:
> If it were so, it was a grievous fault;
> And grievously hath Cæsar answer'd it."

THE USE OF THE COMMA.—As there is some uncertainty regarding the correct uses of the comma, it seems well to give a few common rules that are practically observed by writers. In spite of the growing tendency to punctuate sparingly, it seems necessary in many cases to ensure correct understanding of a sentence by inclosing between commas (1) such words and clauses as limit or characterize the meaning of principal words or ideas; (2) such words and clauses as could be omitted without marring the grammatical unity of the sentence—that is, leaving subject, predicate, and verb; (3) such words and clauses as receive a *change* of stress or emphasis, when the sentence is read aloud understandingly, or where the voice should pause at a logical modification of an idea; (4) such relative clauses as are introduced by *who* and *which*. Commas are also used where words or clauses are omitted, and in such expressions as "The word, love, is full of meaning."

THE PARENTHESIS.—Parentheses indicate either an explanatory remark, or a thought related to what has been said, which is noted but not pursued; and instead of the common sign, two commas, or two semicolons, or two dashes, are often employed. Ex. "Travelling on the plain (which notwithstanding hath its risings and fallings), I discovered Salisbury steeple many miles off." "I find two (husband and wife), both stealing, and but one of them guilty of felony." "Spill not the morning (the quintessence of the day!) in recreation." "Raleigh had (besides his own merits) two good friends."

In good writing the parenthesis is seldom used, except for special purposes, as, for example, to give the equivalent of an English word in a foreign language or a foreign word in English, or to give the value of some monetary or metrical expression in terms of other standards. In common usage, either the comma or the dash is now used where the parenthesis was formerly common. Thus, in the examples given above, dashes would be used in the first; commas, in the second; dashes or commas, in the third, and commas, in the fourth.

BRACKETS are most commonly used as a means of supplying words, obviously needed

for the sense, in quoting passages translated from foreign languages—particularly ancient or barbarous languages—and for indicating changes of person, number or tense of words in a quoted passage, as from a letter. For other examples, see under *Zeugma* below.

In general, the *dash* is used to show that a pause should be made, because the sense is broken off abruptly; or while the sense is not interrupted, something unexpected follows; or to call for greater attention to what is about to be said. Example:

"To die,—to sleep,—
No more;—and, by a sleep, to say we end
The heart-ache, and the thousand natural shocks
That flesh is heir to,—'tis a consummation
Devoutly to be wish'd."

"O thou invisible spirit of wine, if thou hast no name to be known by, let us call thee—devil!"

" 'Thou art a villain.'
" 'You are—a senator.' "

"Some people, handsome by nature, have wilfully deformed themselves;—such as wear Bacchus' colors in their faces, arising not from having—but being—bad *livers.*"

"Romeo, the hate I bear thee can afford
No better term than this—Thou art a villain."

Dashes are also used to inclose parenthetical, explanatory or inserted clauses, which were formerly included between commas or parentheses. Thus: "The law holds that a man and his wife must be regarded as 'one soul inhabiting two bodies' —which expression was original with Sir Matthew Hale—and yet, strangely enough, admits the possibility of divorce."

Other artifices are employed, such as *italics* and SMALL CAPITALS, in typography to represent some of the effects of the tones and inflections of the voice.

RHETORIC

SOME modes of expression, called tropical, or figurative, which are strictly among the matters respecting which rhetoric is conversant, should be noticed here; as they serve to account for some of the forms which have been noticed above.

ELLIPSIS, or omission, is the suppression of some word, which from the nature of what is spoken of, or from the context, can be readily supplied. Ex. "All in vain [is] my frantic calling, all in vain [are] my falling tears!" "[There is] no way to fly, nor strength to hold out flight!" "The knight came to the tailor's [shop.]." "Are you going to the House [of Parliament]?"

PLEONASM, or redundancy, is the introduction of some words not actually required, but often exceedingly effective, as a means of giving peculiar emphasis, or expressing a particular feeling. Ex. "The skipping king, *he* ambled up and down." "They returned *back again* to the *same* city *from* whence they came *forth.*" "The dawn is overcast, *the morning lowers, and heavily with clouds brings on the day.*"

ZEUGMA, or syllepsis, is the suppression of a verb or a noun, in positions in which it will readily be suggested by another verb or noun, which is expressed; and with which the object, or attributive belonging to the suppressed words, appears to be connected. Ex. "And his mouth was opened immediately, and his tongue [loosed];" "forbidding to marry, and [commanding] to abstain from meats;" "my paternal house is desolate, and he himself [my father] destitute and in exile."

RHETORICAL FIGURES.—In writing a language many expressions are used, which, because they depart from the limits of direct speaking, are called "figurative." Among these are the several figures of comparison, direct and indirect; the several figures which use a part to express the whole, or a unit as a type of a collection of related objects. Only the more important figures need be mentioned here.

PERSONIFICATION, or prosopopœia, is the treating of things and subjects without life, even abstractions, as though they were living persons. Ex. "*Confusion* heard his voice." "I have no spur to prick the sides of my *intent,* but only vaulting *ambition,* which o'erleaps itself." "Doth not *wisdom* cry, and *understanding* put forth her voice?" "Make *temperance* thy companion, so shall *health* sit on thy brow."

APOSTROPHE, or address, is frequently akin to personification, as in cases where inanimate objects or abstractions are addressed as though *personal* and *present.* Thus, "Come, gentle Spring." Apostrophe is most common in addresses to the absent or the dead. Thus, David speaks to his dead son: "O Absalom, my son, my son! Would God I had died for thee!"

HYPERBOLE is merely *exaggeration,* and its proper literary use is to give emphasis to a statement of fact. Thus, Voltaire says, "The English gain two hours each day by clipping their words." As it stands, this statement is witty; but had he merely said,

"The English clip their words about five times as much as any other people," merely stating a fact, his remark would have been unworthy further interest. Thus, most witty sayings are mere hyperboles. A certain author remarks, for example, "No classes in society are really happy, except artists and thieves: they always act as they please."

Many exaggerated expressions in common use are merely hyperbolic. Thus, we hear people say; "I am *awfully* tired;" "I just *love* cake;" "What a *splendid* pie!" Similarly, most *profane* expressions come under this same head; consisting essentially in the use of *superlative* words, as descriptions, characterizations or exclamations. Profane swearing consists in such irreverent uses of God's name. Such exaggerations have no real place in literature or rhetoric.

SIMILES AND METAPHORS are expressions of comparison. The first involves a direct comparison, usually introduced by *like, as,* etc. Thus, "The condemnation of Socrates took him away in his full grandeur and glory, *like the setting of a tropical sun.*" A metaphor is an abridged simile. Thus, we speak of a man as a "pillar of the church," rather than saying; "He is like a pillar of the church." Also, we speak of a *"Napoleon* of finance;" "a *Daniel* come to judgment;" "the *Nestor* of Democracy."

METONOMY (Greek, "change of name") is the figure by which we use a word indicating one thing for one indicating another. Ex. "He loves his *bottle* too much," referring to the liquor in the bottle; "I have read *Browning,*" meaning his *works;* "Man doth live *by the sweat of his brow,*" meaning "by the labor causing the sweat."

SYNECDOCHE is a figure allied to metonomy, except for the fact that it involves the use of a part to indicate the whole. Thus, we speak of "thirty *head* of cattle;" "fifty extra *hands*" [men]; "thirty *sail* [ships] on the sea;" "a girl of sixteen *summers*" [years].

ANTITHESIS consists in making a sharp and definite contrast, either between two things or persons or between two ideas connected with one thing or person. Its object is primarily to emphasize what is said about the noun most closely related to the general subject of the writing. Thus: "The prodigal robs his heir, the miser robs himself." "There is no greater joy than love, and no keener pain."

Other methods of emphasizing or enforcing ideas are found in the *epigram,* the *allegory* and the *interrogation.*

EPIGRAM is a terse saying, generally a statement of principle, or a generalization on facts, introduced into a description or discussion as a kind of brief summary or explanation. Thus: "When you have nothing to say, say it."

ALLEGORY is either an elaborated metaphor or else a narration introduced to enforce a point in the discourse. Thus, the Parables of Christ are allegories; so also are the Fables of Æsop.

INTERROGATION, as a figure of rhetoric, consists in obtaining emphasis by putting a statement into the form of a question, although with no notion that it is to be answered in any way. The Scriptures contain many examples of this figure. Thus: "What is man that Thou art mindful of him? Or, The son of man that Thou visitest him?" Evidently, these interrogations expect no answers stating the "what" or the "why." They are merely emphatic statements of man's insignificance before God.

Closely allied to the interrogation is the *exclamation,* which, in addition to taking the form of abrupt remarks, often expressing deep emotion—"How beautiful!" "What eyes!"—are put into the form of questions. Thus: "Can I ever forget that happy day!" The principal difference between interrogation and exclamation in these formal questions is that the former deals *directly* with the subject in hand, while the latter seeks the end of emphasis by introducing a digression from the main subject.

ON WRITING GOOD ENGLISH

SINCE one who writes has but one object, to impart ideas, it follows that he need consider but two things in so doing—grammatical correctness and rhetorical form. Should he violate the rules of grammar, he would incur the danger of rendering his meaning doubtful—even of conveying exactly the opposite idea from that intended; should he wholly violate the canons of rhetorical form, his meaning would be quite as obscure as in the former case, no matter how grammatical his sentences. These statements are true, because grammar is the science of the correct use of words—giving the established rules in regard to their inflection, number, and agreement in a sentence—while rhetoric is the science of the correct formation of sentences, to the end of conveying any desired meaning, without requiring the reader to strive and study, in order to discover it.

THE ESSENTIAL ELEMENTS OF GOOD WRITING

BREVITY AND DIRECTNESS.—The first and most important element of good English writing is a quality to be described by the words, BREVITY and DIRECTNESS. In general, the best sentence conveys the intended meaning in the fewest possible words. When all unnecessary words are omitted, and the arrangement of the sentence allows each part its full value and greatest force, the reader easily grasps the idea. Thus, the best sentence has precisely one aim in view—economy of attention. It avoids all elements that either distract or weary the mind; says what it has to say—no more, no less—then closes.

ELEMENTS OF STYLE.—As defined by a prominent authority, the three important elements of a good English style are CLEARNESS, FORCE, ELEGANCE. Of these he says: "Never forgetting the vast extent of our thoughts and emotions, and the very narrow limits of even the widest vocabulary, we remember that each of our words must not only name an idea, but along with the idea it names must, subtilely but surely, suggest others. I have borrowed from logic two names—there used technically—to express these two powers of words. To their power of naming ideas, I have ventured to give the name, 'denotation'; to their power of suggesting ideas, I have ventured to give the name, 'connotation.' And I have tried to show that such choice and composition of the elements of style as shall best *denote* our meaning is what Clearness demands; that such choice and composition of the elements as shall best *connote our emotion* [in setting forth the ideas] is what Force demands; and that such choice and composition of the elements as shall most exquisitely adapt itself to the eternally elusive immaterial reality of thought and emotion is what Elegance demands. In a single sentence, ... the secret of Clearness lies in denotation; the secret of Force lies in connotation; the secret of Elegance lies in adaptation."

CLEARNESS.—From what has just been said, it is evident that the first requirement in writing is to have something to say and to know exactly what it is. A vague thought can be expressed only in an obscure and ambiguous sentence. In other words, if a writer is struggling to discover just what his own idea is, he will leave his reader in the same uncertainty. This is the fundamental sin against clearness.

A certain well-known critic once remarked: "Many people to-day are writing books on subjects about which they know next to nothing at all. I can tell, by reading a few pages of any book on any subject, whether the writer has a sufficient knowledge of the things he is writing

about. It is not necessary that I should know anything of his subject—I judge solely by the definiteness of the ideas he can give me."

Occasionally, in learned and ignorant alike, we find men whose rapidity of thinking is far in excess of their ability to express—either in writing or speaking. Their ideas flow so rapidly that, before one is fairly stated, another emerges into view, with the result that the hearer or reader is fairly lost in a crowd of words. Writing done under such conditions can be neither interesting nor profitable. Its incoherence fully demonstrates the need of a well-controlled mind as the first requirement for a well-developed literary style.

Other writers of a nearly-allied class are fairly deserving the charge, made by a certain wit, "of knowing so much they don't know anything." Laboring under the impression that their subject is difficult, they intensify its difficulty by writing on it in a crabbed, involved and prolix manner. Struggling to express a meaning, evidently either beyond words or else very poorly grasped by themselves, they complicate their composition by hopelessly long and involved sentences and the too frequent use of subordinate, relative and co-ordinate clauses. This is notoriously the case with such writers as Kant, Hegel, and some other philosophers, whose books abound in sentences of as many as 200 or 300 words, and so hopelessly involved that many of their ideas are quite lost to the world.

The student of English composition should be assured of two points: (1) no subject is so difficult that it can not be clearly stated by a person who has mastered it; and (2) an obscure style is nearly the best evidence of the writer's ignorance of the subject he attempts to treat, or of the language he attempts to write. This does not mean that all subjects can be exhausted in treatises of small compass—some demand extensive space for adequate statement and full explanation, with the best understanding in the writer.

The Elements of Clearness.—To attain the end of clearness in expression, two things are required: (1) logical arrangement of ideas and (2) words suited to express them. If a writer wishes to describe a city, a house, a person, or any other object, he should definitely catalogue, either in his mind or on paper, the points he intends to bring out; then, arrange them in order, either from most important to least important, or the opposite, according to the emotion he wishes to excite in his reader's mind: finally, state them in the fewest and most expressive words possible. Of course, much depends, in this class of writing, upon the aim the writer has in view. If he merely wishes to reproduce the picture before the eye of his mind, he needs only to state the points as briefly as elegance will permit. If he wishes to reproduce in the reader's mind an emotion he himself has experienced in contemplating the object in question, greater license in the choice of words is allowable. The main points should be definitely stated, and only minor and unimportant matters left to the reader's imagination. The methods of proceeding in this work vary with different writers. Some find that discussion is the best clarifier of ideas, and make it a practice to talk over with some friend—preferably with a "good listener"—all the details of the proposed writing. Talking over ideas undoubtedly gives them a definite form, but one may speak them aloud by himself, without afflicting a friend or wife with his crude thoughts. Many writers lose interest in the thoughts that they have thus *prematurely* given to others. Others prepare "skeletons" of the composition, arranging the bare ideas in order on paper, and indicating all the connections and transitions, previous to starting the actual work of writing. This method is largely followed in the preparation of treatises on special subjects and in writing sermons, essays, etc., as well as in laying out material for descriptions. It has the advantage of assisting the mind in perfecting its own conceptions, but, according to some, rather tends to shackle spontaneity of expression. A certain college professor states that, in preparing his lectures, he writes his ideas on labelled cards, which he subsequently arranges in the order that seems best fitted to give unity to the composition. Numerous authors avoid all such helps, sitting down to write with only a very general idea of the lines of treatment to be followed, and developing their subjects as they proceed. Such a method is probably the one most often followed by trained wirters, but generally involves an immense amount of revising and re-editing after the first draft is complete. It is not uncommon to hear that some certain author rewrote such and such a book of his as many as ten or twelve times, before he considered it ready for publication.

Literary Form.—Next in importance, to clearly and definitely conceiving the subject to be written up, comes the question of *form*. To attain the end of clearness,

we must stop midway between the mere "snapshot" mention, which says too little, and the precise prolixity of a legal document, which says too much. If, for example, a writer wishes to describe a certain man's personal appearance and characteristics, he avoids the detailed catalogue of a Bertillon "card of identification," and gives only such broad, general facts as leave a distinct impression on the reader's mind, with a larger number of details to be supplied by imagination. Thus, if a character in a story is described as having a "harsh and strident voice and an exaggerated red nose," the reader obtains a far more vivid picture than would be possible with two pages of minute description. Indeed, it is not too much to say that the habit of writing lengthy descriptions of persons, places, and scenes, in fiction or any other kind of artistic writing, is properly called a "literary sin," because it defeats the very end it is intended to serve. The reader's attention wanes before he has finished reading them.

THE VICE OF DETAILED DESCRIPTIONS.—Professor Wendell of Harvard well says: "The trouble of undue specification is not confined to legal documents. Almost any novel you choose to open will give you an example of it, . . . a heroine whose personal appearance is described at considerable length. We are told that she is not very tall, for example, but has a perfect figure; that she has great masses of golden hair, or dark, as the case may be; delicately arched eyebrows; a nose perhaps the least bit *retroussé;* a sensitive mouth; a very fine complexion, and so on, often for a page or more. This kind of thing is carefully specific: it often stands for a very definite image in the mind of the writer; but it never conveys to my mind—or to any other man's whom I have plied with questions—any unmistakable idea of what the young woman in question looks like. . . . . To analyze her appearance in detail is really to do just what lawyers do when they describe a piece of real estate; to be a great deal more specific than, for ordinary human purposes, the thought is which we are trying to express. In short, we are in some degree obscure because we use too many words."

THE ELEMENTS OF FORCE.—The end of clearness is defeated in lengthy and detailed descriptions, not only by the use of too many words, which overtax the reader's attention, but also because that, in most such cases, there is little or no inducement to retain interest. This is precisely the point at which such compositions are found to lack the important element of *force.* They may be calculated, like a title deed or a scientific analysis, to give very precise information to those who seek it, but they utterly fail to reproduce the emotions that possibly gave them birth.

To be brief, the detailed description, as such, has no proper place in literary composition, although Dickens, and several other writers of note, have used it largely. It can, however, receive a human interest by the introduction of humorous passages, witty epigrams, enlivening similes and picturesque remarks. In this manner, the most detailed accounts of natural scenery, buildings, cities, or other objects—historical narrations, accounts of persons, or dissertations on the driest topics—may be rendered extremely entertaining to the average reader. With some such idea in mind, many preachers have essayed to introduce humorous passages into their sermons, hoping to reach the hearts of their listeners by entertaining them. Other writers, with equally serious aims, sociological, religious, or moral, have written stories for the sole purpose of enlivening discussions that would, otherwise, go unread. It must not be forgotten, however, that it requires the greatest skill to thus impart force, or "connotation" of ideas, as Professor Wendell calls it, into matter otherwise devoid of common interest.

The lack of force in a composition may be well illustrated by the familiar experience of a humorous story told by a "poor story-teller." Such a person, owing perhaps to lack of training and practice in this particular line, invariably "misses the point"; and the narration, intended to excite laughter, is received with a disappointing silence. Another person can take a story of only moderate interest, and so embellish it that it never fails to evoke the desired emotion. Similarly, some speakers, dilating on conditions that have excited their own sympathy, fail of imparting their sentiments to their hearers by a profuseness of emotion and a lack of skill in the use of words. Thus, a certain missionary from the "wild West," in addressing a meeting at an Eastern church, described the funeral of a cowboy, who, for lack of a better casket, was buried in two barrels—one slid over his feet, the other over his head. This incident, indifferent enough in the eyes of the average man, excited him to such a height of tragic oratory that the audience burst into roars

of laughter. He had not only failed to convey the emotion he himself seemed to feel, but had actually excited its direct opposite.

Force in the Statement of Ideas.—In the attempt to gain *force* in writing or speaking, extremes must be carefully avoided. Each passage must be framed so as to appeal to the *average mind;* neither wearying it by attempts at classic loftiness —a glaring fault of Seventeenth Century poets and writers—nor yet repelling it by a too obvious vulgarity, as is often done to-day. Professor Wendell remarks on this point: "In their own little way, 'Pinafore' and 'The Pirates of Penzance' and 'Patience' were a great deal more *forcible,* in the sense in which I use the term, than the works called 'better' and the works admitted to be worse; each of which appealed to the emotions of only one of the classes who joined in enjoying these. Always remembering, then, that the average man is not a vulgar fellow, but one who combines the traits common to gentle and vulgar alike, we may safely say that the most forcible writing is that which holds his attention."

Methods of Obtaining Force.—In a certain sense, some persons are qualified naturally to write with true force and effect, on account of a facility at analyzing and defining ideas; stating them in the clearest manner, and discerning their relations to other ideas—that is to say, in comparing one thing with others. The art may be cultivated, however, by closely observing the principles underlying good composition.

Force in writing is most largely obtained by the use (1) of the most descriptive words, and (2) of *tropes* or rhetorical figures. Of course, the choice of both words and figures is always determined by the *effect* the writing is intended to produce. After the end of clearness has been obtained by complete conception of ideas and the use of the simplest grammatical constructions, it is in place to determine in what manner we wish a given passage to be understood—that is, what emotion we wish it to evoke. An effective writer must have a good vocabulary, and a fair sense of the shades of meaning belonging to different synonymous words. He must not use words above common comprehension, lest he miss the desired effect, nor yet words too colloquial, unless he intends to be humorous. In general, the simplest effects, obtained by the use of the simplest words, give by far the most forceful composition, since we should often leave a great part of an emotion to be supplied by imagination, just as we leave the full meaning of an idea.

Force in the Choice of Words.—A few examples will suffice to illustrate what is meant. In most fiction of the present time, a love affair is the central part of the story and the heroine altogether the most interesting character. It is necessary, therefore, that the author set forth the attractions of the heroine in the most advantageous manner. To use words regarding her or her attractions that are either ambiguous or insufficient to the end in view, means only to lose the reader's sympathy. Thus, a certain writer of short stories mars the effect of his description by speaking several times of his heroine as "my charmer." That this word is clear in a certain sense can not be doubted: for a woman who enchains a man's devotion certainly *charms* him in a very real sense. But the word is insufficient to describe the sentiment we like to attribute to a lover, and certainly is burdened with many associations far from ideal—such as "snake-charmer." We also speak of a woman as "charming," without involving the idea that our sentiment partakes of love. Should the words, "beloved," "dear one," "idol," or even "darling" be used, the full meaning is still unexpressed, and the dignity of the subject disregarded. An experienced editor changed the expression in one case into "the one woman in the world," and, in another, into "my queen"; both of which better convey the adoration a man is supposed to feel for a woman he loves. Such words are more forceful, because more expressive, more descriptive of the emotion involved.

Similarly, in describing a heroine, some writers would be satisfied with calling her "beautiful," "fascinating," "elegant." But, while all the qualities described by these words are desirable, perhaps necessary, in a woman, they contain no suggestion that would compel the reader to sympathize with the sentiments of her lover. In one of the most effective of modern romances, the hero is thrown with a woman under such exceptional circumstances as permit the display of remarkable and heroic traits on her part. The hero speaks thus: "A great wonder and gratitude grew in my heart, wonder that a woman could be so brave, gratitude for the love she gave me. . . . . I felt that no woman could ever be so dear to me as this glorious woman, no, not even my betrothed." While it may be

that no reader has ever seen a woman whom he could describe as "glorious," the emotion it evokes is one that all can appreciate. It is a word that includes the ideas of beauty, grandeur, nobility, loveliness, and yet expresses more than all of them. A similarly effective expression, borrowed from another author, is a "gracious, lovely girl," which contains a wealth of suggestion in two words.

To sum up, an author must choose a word that best suits the emotion he feels, or would evoke, and this is often a matter for long and careful study. It is useless for one to attempt to write *forcibly,* unless his vocabulary is sufficiently large to express all the shades of meaning he may desire to give. A large vocabulary can not be properly derived from study of the dictionary, nor yet from the careful perusal of such useful works as Crabbe's "Synonymes" or Roget's "Thesaurus of English Words." It comes best from wide reading of the best authors, and careful attention to their methods of expression. An excellent way to obtain facility in the use of expressive words is to make notes of forceful passages, encountered in the course of reading, and to carefully study their meaning.

FORCE IN THE USE OF FIGURES.—The second element of *forceful* writing is found in the use of figures of speech, already catalogued and described in the article on grammar. These tropes, when properly conceived and worded, enable a phrase or a sentence to convey the same wealth of meaning as we have seen can be expressed in a well-chosen word. In fact, it is by the judicious use of figures that authors are able to produce most of the "sayings that stick," the "quotable passages" and the condensed epigrams that mean so much.

The several processes of gaining force by the use of tropes are: SUBSTITUTION, in the use of *metonymy* and *synecdoche;* COMPARISON, in the use of *simile, metaphor,* and *antithesis;* INVERSION, in the use of *irony;* EXAGGERATION, in the use of *hyperbole;* and VIVIDNESS, in the use of *allegory, apostrophe,* and *personification.*

RULE GOVERNING THE USE OF FIGURES.—One rule holds good for the use of all figures: *force* requires that in no case, except in humorous writing, should an idea be compared with or stated in the terms of another, when the difference or separation between them is too marked. Thus, the *sublime* and the *commonplace* should never be coupled in a figure, except in the description of love, religion, or other emotions that are essentially noble and exalted. The *force of a figure is lost* when a comparison is made, for example, between the doings of a king or other exalted personage —as the world estimates them—and those of a man whose activities are limited to his garden or his store. It may be perfectly admissible to use metaphors for a person of the latter class, describing him as a "king among men," "one of nature's noblemen," "one of ten thousand"—although this sort of thing may be overdone; but to elaborate the figure much further merely challenges popular opinion, which sharply discriminates between kings and "commoners."

On the other hand, an idea that is august, noble, and exalted in itself—such as the love of man for woman, the love of a mother for her child—may suffer, rather than benefit, by the use of a too elaborate figure. Descriptions of human love fail of considerable force by attempts to develop comparisons with religious mysteries, or, to import too much of the sublimity belonging to other great and grand subjects. The average mind does not sympathize with the idea of love that "soars among the clouds and jostles the stars"—the idealism of true love is somewhat too beautiful for adequate expression, and the definiteness, even of *sublime* figures, rather disappoints than describes.

The right use of figures, like the right use of words, comes only by wide reading of the best authors, and close observation of their style. In general, however, a figure that is most forcible is also one that is briefest, most to the point, and best worded. Lengthy figures and allegories, except in very rare occasions, and *in the hands of the most skilful writers,* usually fail of force by their very length, and presently appear even humorous.

Properly speaking, a figure of speech merely sets forth the picture suggested to the mind by a given fact or occurrence, and is merely a survival of the picturesque talk of primitive peoples. Primitive minds, partly from lack of exhaustive knowledge and partly from strong and vivid imagination, have originated very many of the figures now used by poets and writers, and considered forceful and expressive. The best modern parallel to the imagery of savages is found in the line of picturesque words and expressions, known as "slang"—this does not include profane and vulgar words—which, as has been often remarked, "all understand at the first hearing."

EXAMPLES OF FORCEFUL FIGURES.—Contrary to the supposition of young writers in general, force in the use of figures does not consist in long, high-sounding, or even elegant, words. Frequently, the best examples of this quality may be derived from newspaper writers and authors whom the "elect" will never allow to be "literary." Thus, in a newspaper article describing a parasite believed to be fatal to mosquitoes, the writer remarks: "It gets inside the mosquito and *does things*, and the mosquito dies." This sentence is eminently more effective than a column of scientific discussion that few understand and fewer read. A well-known humorous writer, describing a young man's enthusiasm over a girl's dancing, writes: "He told her . . . . that when he thought *how beautifully she picked them up and set them down*, she made all the other girls of his acquaintance *look like a set of cripples*." Such passages lack decidedly in several particulars, but no one can mistake their meaning.

A well-turned sentence, particularly one that involves a humorous antithesis, even a descent from sublime to ludicrous, is often more effective than the best-conceived and most persuasive line of argument. Thus, a story told of Abraham Lincoln relates that, when practicing at the bar, he argued a case against one of the best jury lawyers in the State. In summing up, his opponent made a long and impassioned address, which evidently appealed strongly to the emotions of the jury and spectators. Mr. Lincoln, seeing that his first work must be to destroy the effect thus produced, began hesitatingly: "Gentlemen of the Jury: Mr. ——— has made a great speech. It has affected us all; it has affected me. I have the greatest respect for Mr. ——— personally, and I have the greatest respect for his talents. Indeed, I may say, I have only one fault to find with him, and that is that *he wears one of these new-fangled shirts that button behind*." By this sentence he changed the strong impression of his opponent, exciting a violent laughter that completely obliterated deeper emotions.

The descriptive power of figurative writing may be illustrated by a passage from one of Edgar Poe's tales: "The beauty of Eleonora was that of the Seraphim; but she was a maiden artless and innocent as the brief life she had led among the flowers." None knows, to be sure, exactly what the "beauty of the Seraphim" may mean, but a better expression for *superlative loveliness* could scarcely be conceived. Another passage of similar purport reads thus: "Otomie seemed such a woman as men dream of but very rarely win, seeing that the world has few such natures and fewer nurseries where they can be reared." Here another well-constructed hyberbole gains the interest and sympathy of the reader.

Perhaps the choicest example of figurative writing was produced by a noted poet —Crashaw, it is said—in his early youth. Having been commanded by his teacher to write a poem descriptive of Christ's miracle of turning water into wine, he neglected the task until the very last moment; then wrote but a single line. It is as follows:

"The conscious water saw its God and blushed."

There was no need for addition: that one line tells the story perfectly.

ELEGANCE OR CONSISTENCY.—On the matter of *elegance* in style there is little to be said. Elegance does not involve the use of high-sounding words and ambitious phrases. It frequently means quite the opposite. Briefly described, it involves but one thing—that the language and the treatment should be in keeping with the subject. In scientific or descriptive writing all that is needed is lucidity, with such embellishments as contribute to clearness and precision. In writings more distinctively literary, force and fitness are of equal importance. Thus, while a story of ancient times should, logically, require the use of classic words and figures, a story of the present should, in all respects possible, be told with the language and imagery of to-day. A homely story demands homely words and phrases—it may even be heroic with these. Take, for example, John Hay's poem, "Jim Bludso":

"'Mid the hot black breath of the burnin' boat
Jim Bludso's voice was heard;
An' they all had faith in his cussedness, an' knowed how he'd keep his word.
An' sure's you live they all got off afore the smokestacks fell,
An' Bludso's ghost went up alone in the smoke of the *Prairie Belle*.

. . . . . .

He seen his duty, a dead sure thing,
An' he went for it, thar an' then,
An' Christ ain't a goin' to be too hard
On a man what died for men."

There are some things that a schoolmaster might criticise in this poem, but it tells its story. Had its author attempted to use the stilted verse and the classical pedantry of some of our older poets, his production might have seemed humorous

to some, and certainly would have missed its effect with all readers. It is a masterpiece, simply because it takes a character, low according to many standards, and brings out its inherent heroism in the language of its own environment. It thus fulfils the requirements of what may be called "true literary elegance." Although the language is crude and vulgar, the emotional effect is lofty, the deficiencies in the words not obscuring the meaning.

Brief Rules for the Student.—The student ambitious to write good English must, first of all, learn that writing is a trade, a craft, or a business, as he prefers. As such it demands close and careful study: (1) of the laws of grammar; (2) of the laws of analyzing, conceiving, and stating ideas; (3) in the use of words and phrases that most *clearly, forcibly,* and *elegantly* express what he wishes to say. A knowledge of words and phrases—of language—can be acquired only by reading the best authors, masters of the language; carefully studying their words and, as carefully, comparing their uses with those of other authorities. Above all, a writer should never use a word until, by study of the dictionary and table of synonyms, he is certain that it expresses precisely the idea he would set forth, and may be understood to imply no other. This assured, his sole remaining task is to so frame his sentences that each word has its full weight and value, and that no more words are used than expression of the idea demands. By carefully following these rules, he may learn the secret of a good English style.

HOW TO WRITE FICTION

THE student of writing must remember that the calling of the professional writer may be either a craft—that is, a trade—or an art. A craftsman in any line may have the utmost skill in the use of the tools and materials of his occupation, and may be able to produce the most highly finished work. He can not be said to be an *artist*, however, until he originates as well as executes. A carpenter or mason, for example, may be able to construct a building to agree with the architect's designs, even to the minutest particular. But he is limited in his field of usefulness, so long as he must reproduce the designs of others, and can not originate designs himself. On the other hand, a man may have great ability at designing—he may be able to draw out and plan splendid buildings—but, if he lacks training in practical details of construction, he can not be called an architect: he is only a dreamer.

The same principles apply eminently well in writing, drawing, and other branches of what are usually described as "artistic callings": a man must combine the ability of conceiving or designing with that of executing. He must not burden his mind with thoughts and ideas that "can find no expression." Any ignoramus can do that. The place of art is to enable the expression of ideas; to supply the requisite talent to the innate genius which dreams, conceives, designs. Art is, in brief, the ability to express nature; and the greater the art, the closer to nature the produced effects.

NECESSARY PRINCIPLES OF FICTION WRITING

THE TECHNIQUE OF WRITING.—The technique of writing has already been explained in the section on "How to Write Good English." It is unnecessary to add more for the theoretical instruction of the would-be story-writer. What most concerns him is the nature of the subjects to be chosen and the proper methods of treating them.

THE CHOICE OF SUBJECTS.—So far as the nature of subjects is concerned, it may be said that it is quite immaterial—of course, within the limits of decency and propriety. No subject is too commonplace to be rendered interesting by a skilful writer. Indeed, some of the most successful writers have based their popularity on tales of the homeliest description—taking every-day characters, doing and saying every-day things, and making them acceptable and delightful to the most critical readers. The possibilities of this sort of writing are to be found in the short stories of Mary E. Wilkins, Eugene Field, and some others of more or less note. A study of their productions reveals the fact that the charm and true artistic quality lie in *what they can find* in their characters and incidents; not in what every one can see for himself, unaided. In this we see how that true art expresses nature, and finds the most in nature to express.

STUDYING FROM LIFE.—For a person ambitious to write fiction, the best training

in the world is to cultivate the habits (1) of observing people, their actions and motives; (2) of writing down such incidents as attract the attention in any way. The object of constantly observing is to enable the mind to form clear ideas of life and character. The object of writing down each little incident is to obtain facility in clear and forcible expression, and also to put it into shape for further elaboration and embellishment. The best teachers of English composition require their pupils to write something every day—one hundred words at least, on trivial topics, even, if none others be found—and then to carefully study and edit, to reduce to the smallest possible compass in words and space. This was the training of one of the cleverest of modern writers of short stories, Guy de Maupassant, whose sketches of every-day life and doings are among the most readable and entertaining to be found in any language. His facility of expression is immense, and his use of words admirable.

Exercises in Writing.—The sort of things that an earnest student will thus write daily, for exercise, are what many ambitious young writers dare to submit to magazine editors—it is needless to say, unsuccessfully. A careful study of the stories of noted writers, however, will show the beginner exactly how serious a competition he must meet, if unskilled in his craft and unpracticed in his art, and make him careful to prepare thoroughly for the field he desires to enter.

After he has acquired a moderate facility at expression in recording the bare incidents of a story, he must give particular attention to such embellishments as scene and character description and conversation. As previously stated, descriptions should be as brief as possible. If of scenes or persons, the important features only should be given in an introductory passage, leaving necessary details to be supplied as the incidents of the narration require. The lengthy passages of description, used by some of the best novelists of former days, are scarcely acceptable at present; the interest of the reading public being more particularly centred on the development of character and of dramatic incident. Since, in such passages as are necessary, *force* requires that a few bold strokes should draw the picture, it is desirable to make them as brief as the necessary elements will permit.

On Introductions and Descriptions.—To be more precise, the consensus of practice among the best writers is to avoid *introductions* of any kind, and, plunging into the midst of the story, supply the elements of "stage-setting," so to speak, as the plot develops. This canon is founded on the observed fact that the average reader is liable to skip introductory passages—supposing them to be written only "for the sake of setting off rhetorical fireworks"—and that, if he is to receive a distinct impression of the desired picture, its elements are to be introduced, as far as possible, as required. This is more or less logical from the analogy of a theatre play: the audience does not note the minute details of the scenery, or stage settings, until some turn in the acting calls for the use of a certain piece of "business."

Play-Writing as an Exercise.—There is, indeed, a closer relation between a well-developed story—particularly one filled with incident and conversation—and a play, than might at first be supposed. Nearly the surest way to develop such a plot, clearly and effectively, is to write it first as a play. By keeping in mind the effects to be produced, in the event of a dramatic presentation, the writer may hold his dialogues within reasonable limits, and also obtain a clearer conception of the proper points for the introduction of descriptive passages. When the play is then rewritten in narrative form, it is possible to present every detail in the briefest and most effective manner.

Delineations of Character.—As already stated, nearly the same principles apply to descriptions of persons. These should always be as brief and to the point as possible. The writer should have a clear conception of the character he wishes to develop, and of the traits most important to his story. He should state these, leaving other matters unmentioned, or to be mentioned as the development of the plot requires. For example: if a character exists in a story principally for the sake of supplying the hero for a love episode, it is highly unnecessary to include in a paragraph introducing him, that he seemed to be "a man possessed of indomitable courage"; or that "he showed evidence of splendid self-mastery"; or that he was "faultless in his carriage and deportment." The reader can judge of these points, if necessary, as the plot progresses. Consider, therefore, what traits and qualities must be mentioned, for the sake of clearness; mention only these, and express the description in the fewest and most forcible words.

Descriptions of Persons.—In describing the personal appearance of characters, it must not be forgotten that the element of *force* is equally important with *clearness*. This means that the writer should speak or refrain from speaking, solely with reference to the *emotional effect* he desires in his reader. If a character is presented for the reader's sympathetic attention, particularly as the hero or heroine of a love story, the fewer the details of personal appearance, the better for the effect. This principle holds good for the very evident reason that a well-written love story has the power to strongly picture the sentiment of love to the reader's mind. Some readers have strong preferences, and, if the too precise description of the hero or heroine clashes with their own ideals of beauty, the effect is less pleasing. True art expresses just enough in these matters to leave many important points to the reader's imagination. Indeed, vivid narration always consists in the use of words that *suggest*, rather than in expressed details of any variety.

Evil Characters.—If the character portrayed is proposed as a villain, a marplot, or an ordinary scoundrel, a greater license of description is allowable by the taste of modern readers and critics. Two excellent examples will suffice. The villain of the story is thus described in Anthony Hope's "Phroso": "He was a tall, full-bodied man, apparently somewhat under fifty years old; his face was heavy and broad, in complexion, dark and sallow; he wore a short black beard; his lips were full, his eyes acute and small. I did not like the look of him much; but he meant law and order and civilization, and an end to the wild ways of Neopalia." The villain is thus described in Du Maurier's "Trilby": "A tall, bony individual, of Jewish aspect, well-featured but sinister. He was very shabby and dirty, and wore a red *berét* and a large velveteen coat, with a big metal clasp at the collar. His thick, heavy, languid, lustreless black hair fell down behind his ears on to his shoulders, in that musician-like way that is so offensive to the normal Englishman. He had bold, brilliant black eyes, with long heavy lids; a thin, sallow face, and a beard of burnt-up black that grew almost from his under eyelids; and over it his mustache, a shade lighter, fell in two long, spiral twists." Both these descriptions are excellent in saying no more than necessary—although the latter begins to be prolix—and compare favorably with Dickens's description of Daniel Quilp, for example, in "The Old Curiosity Shop."

Ludicrous Characters.—In describing a character intended to be ludicrous, it is even more important to avoid all references not directly to the point. The object of this is to avoid, on the one hand, remarks that are not humorous, but tiresome—even silly—and, on the other, such as are liable to excite pity for affliction or poverty. If the pertinent points regarding a ludicrous character are that he is "long-legged, raw-boned, with bushy black hair and a high-keyed nasal voice," that is all that need be said about him. Further elaboration would tend to obscure, rather than embellish, the picture. If he is "meek-looking, hollow-chested, of hesitating gait, with a sad expression, as though conscience-troubled over the sins none would suspect he had courage to commit," it is needless to enlarge upon other physical or mental defects.

Characters from Life.—In the selection of characters, the very best procedure for the young writer is to "write up" people he knows in real life. Occasionally we meet, in every-day experience, men and women of such strongly developed traits, as to excite the interest of the most inappreciative. Regarding such the remark is often made, "He would look well in a story," or "Charles Dickens should have got hold of him." In taking such people as promising material for future novels, it is useless to begin by attempting analysis of character, since the majority of traits appear only as a large number of anecdotes are noted and studied. If interesting persons say or do things worthy of mention, write down their sayings or doings—write down even the least notable. After a large number of these incidents have been collected, it is possible to deduce some general characteristics of mind and temperament that will serve the purposes of a story.

Creating a Character.—Frequently, such a systematic study of a living person will suggest a fictitious character corresponding to what he or she "might have been" under different circumstances. The writer may then venture to *create* a character, which does not correspond exactly to any one he has ever known. But his safest plan is to act as a simple recorder of persons, events, and conversations, until practice has given him sufficient insight into human nature to originate in these particulars. Even then, the effective writer continues to be the student, the observer, the man with a notebook; and, as his experience grows greater, he is the more will-

ing to acknowledge that often the most trivial incidents have suggested plots and situations for his greatest works.

On Conversations.—The careful study of characters and incidents from the life will restrain the beginner from one glaring error of untrained writers—the tiresome dialogue. He will observe, if he is sufficiently earnest and attentive, that living people do not engage in dialogues calculated to show out their particular traits—these appear naturally, and more often in the manner than in the spoken word. Thus, in attempting to conceive conversations in a story, he avoids the "long-winded talking matches" found in many popular novels, and follows nature in keeping his dialogues reasonably near to the subject in hand. In short, the successful dialogist is one who has closely observed how people talk, when they have anything to say. He does not waste time recording the painful efforts of several persons, who, judging by some showings, must have been paid by the hour "to talk against time."

On Scenes and Settings.—The same rules regarding careful study apply to scenes and modes of life. The careful writer—the one who is destined to obtain recognition in his calling—will never attempt to write a tale whose setting is in a country, a time or a condition of life with which he is not perfectly familiar. Many persons of good talents and possibilities in writing become discouraged at repeated editorial rebuffs, simply because they have attempted to imitate some admired author, rather than to write on themes and characters familiar to them. One who has been reared in the quiet atmosphere of a country village can not possibly produce an effective story of adventure, in the wild West, in Africa, or in the islands of the sea. To construct a story in any one of these settings, he must have travelled in these lands, or else have read books describing their conditions of life and scenery. After he has read or travelled sufficiently widely, he may be able to originate scenery and an atmosphere peculiarly his own, composed of generalizations on the many and various types familiar to him. Until so advantaged, his only duty is to work incessantly to develop his powers of description, along the lines already indicated.

The Treatment of Emotions.—The final, although in many respects the most important, thing for the story-writer to observe is, the utmost care and attention in describing human emotions—most particularly those of love, grief, and some of the more dramatic, such as joy, despair, and perplexity.

As the emotion of love is the one most commonly treated in modern literature, it is the only one we need discuss at length. To say that the treatment of this sentiment should be carefully conceived and fully developed, means precisely that the writer should thoroughly understand it from study, observation, and reading—if not from personal experience—before attempting to depict it in writing. This is particularly necessary to good literary effect, since positively no one can grasp the situation between true lovers without having direct knowledge from the life. This fact is amply evidenced in the crude, green, and callow love episodes, so common in school and college papers, all of which reveal a knowledge of the subject quite as completely adequate as the sinner's conception of heavenly beatitudes, or the child's anticipations of maturity. If young people had a clearer idea of what constitutes real love, there would be fewer glaring matrimonial mistakes. But, owing to the fact that their actions in this particular are so often devoid of sense, we can not expect that their literary analyses will be much more luminous. No emotion of the soul requires deeper study and wider experience to describe: and none is so utterly uncertain and elusive.

A Literary Analysis of Love.—A certain author, whose views are evidently mature, writes as follows of the sentiment of love: "It is properly," he says, "the lasting result of true temperamental affinity between two persons, or of such a state of congruity in their characters and general qualities, as renders possible an association beneficial in every sense. Instead of being known by the intensity of the passion it engenders, it frequently begins and continues far differently, because easily its most important attribute is mutual respect. Thus it is that some attachments, which begin with most exalted idealizations, are of the most evanescent description; concluding with an even greater intensity of quite opposite sentiments. As it is the exclusive prerogative of maturity to love and be loved, truly and completely, so it is true that a life-union, based on mutual regard, should be contracted solely in obedience to the dictates of mature judgment and in the light of vital facts. The boy admires beauty of person; the man—whenever, indeed, th-

male human rises to the dignity of that title—esteems noble character and womanly traits quite as highly. Of these latter, however, the boy has no conception."

If the young writer can gain any kind of vivid notion from such an analysis as this, he may venture to handle the subject in a story. If it seems vague and unfamiliar, he should certainly study and observe more closely, and read good love stories more carefully. In any event, the barest outlines only should be treated, until a mature experience gives a clew to the real conditions. The same is true of very many other emotions and sentiments.

Regarding Names.—Some authorities would advise the young writer to be careful about the names appended to his characters. This is desirable for two important reasons. In the first place, some writers of keen sensibility have complained that an ill-chosen name—one having uncomfortable associations, one that is cacophonious or too commonplace—will cause them to detest the character before the work is done, and often to lay the story aside. In the second place, a name is a very definite and important part of the reader's impression of the character. Thus it is that we find such a profusion of Adairs, Lees, and other euphonious names in poetical literature.

As a good general rule, we may say that the heroine of a story should never have a harsh or ignoble name—although the contrary extreme is often as bad—and no character intended to be admired should be called by a name frequently used in comic narrations. Descriptive names should always be avoided, except in comic stories; since the effect produced is most often of that description. Dickens often violates this rule: but every writer does not possess his genius.

Summary.—Enough has already been said to convince the aspiring story-teller that he must work and study hard to gain proficiency. He must study scenes, characters, conversations, emotions, both in nature and in literature. He must write frequently and regularly to perfect both his ideas and his style, and he must constantly revise and rewrite, in order to secure the all-important end of force, both in general and in particular.

Sir Walter Besant, the English novelist, gives the following rules for the guidance of the aspiring author: "1. Practice writing something original every day. 2. Cultivate the habit of observation. 3. Work regularly at certain hours. 4. Read no rubbish. 5. Aim at the formation of style. 6. Endeavor to be dramatic. 7. A great element of dramatic skill is selection. 8. Avoid the sin of writing about a character. 9. Never attempt to describe any kind of life except that with which you are familiar. 10. Learn as much as you can about men and women. 11. For the sake of forming a good natural style and acquiring command of language, write poetry."

THE WRITING OF POETRY

POETRY is really the oldest form of literature, dating, in fact, from times prior to the invention—or common use—of writing. It consists essentially of a peculiar use of language and figures of speech, as will be presently explained, and of certain metrical forms that render a poetical composition capable of being sung to appropriate music. Thus, the development of poetry has progressed, hand in hand, with that of music: the more elaborate the music of a time or nation, the more various the embellishments of its poetry. The crudity of ancient music thus gives us a clew to the deficiencies in ancient poetry.

The peculiar constructions and rhythm of poetry serve another use —to enable a readier memorizing—since, in early times, the bards were accustomed to commit wonderfully lengthy passages, sometimes entire books, and to sing the words; accompanying their voices on their harps, lyres, or other instruments. The ease with which even the crudest poetry may be committed to memory makes it superior to prose—or unrhythmatic composition—as a vehicle for the perpetuation of ideas among unliterary peoples.

The Hebrew literature furnishes examples of nearly the most primitive order of poetry. Here we find only a very rudimentary kind of rhythm, but a large number of poetical forms or variations of prepositions, prefixes, and word terminations. The construction of sentences is also different. However, the peculiar use of parallelism—or repetitions of a statement in different words—is nearly the most characteristic effect.

In the classic languages, Latin and Greek, we find poetical rhythm in a wide variety of forms, and consisting principally in measuring the line into so many "feet," each composed of definite combinations of long and short syllables. Classic poetry, however, consists entirely of blank, or unrhymed, verse. Perhaps the most common classic metres are the dactylic *hexameter* (six-metre) and the *pentameter* (five-metre), the former being most widely used for epic and heroic poetry. The difference is vividly illustrated in the following English verses:

> "In the hexameter rises the fountain's silvery column:
> In the pentameter, aye, falling in melody back."

The division into feet, according to the length of syllables, may be shown in the first line of Virgil's "Æneid":

"Arma virumque cano Trojæ qui primus ab oris.
Armă vĭ-|rūmqŭe că-|nō||Trō-|jæ qūi|prīmŭs ăb|ōrīs.|"

The single vertical lines indicate the separation of the feet: the double vertical lines, the cæsural pause, which is the all-important element in this kind of verse.

Rhymed verses appear as a permanent variety of Latin poetry only in the Middle Ages, and then principally in hymns and religious odes. That this language lends itself beautifully to such composition may be judged from the following extract from the famous Hymn of Bernard of Cluny, from which the well-known "Jerusalem the Golden" was translated. It is in rhymed hexameter:

"Hic breve vivitur, hic breve plangitur, hic breve fletur;
Non breve vivere, non breve plangere retribuetur;
O retributio! stat brevis actio, vita perennis;
O retributio! cœlica mansio, stat lue plenis;
Quid datur et quibus? æther egentibus et cruce dignis,
Sidera vermibus, optima sontibus, astra malignis."

The bulk of the poetry in modern literature is in rhyme; blank verse being reserved almost exclusively for long narrative poems, and seldom used by later writers. The high development of music at the present time also contributes to the number and variety of poetical metres.

Of the imitations of classical metres little needs to be said, except that they are not adapted to the genius of our language. Many attempts have been made to render them acceptable, some with considerable success; but the great number of our monosyllables will always prevent them from coming into general use or favor.

PRACTICAL ELEMENTS OF METRICAL COMPOSITION

PROSODY A DEPARTMENT OF RHETORIC.—The department of rhetoric and grammar treating of poetry—its classification and construction—is called prosody. This word is derived from the Greek *prosodia,* signifying "accent," "tone," or a "song." The word poem comes from the Greek verb, *poieo,* "I make," "I do," and signifies, literally, a "work," "something done." The principal subjects included under the head of prosody are accent, quantity, rhythm, rhyme, alliteration.

ACCENT is the stress laid upon one or more syllables of a word. Monosyllables are capable of accents only when they are uttered with other words. Ex. Fáther, índustry, nightingale, himsélf, disséver, éxquisitely, whátsoéver, volúptuous;—"there is thát in his fáce which léads one to trúst him."

QUANTITY is the time required to pronounce a syllable, and is either long, marked (-), or short, marked (⏑). Seĕing, ŭpright, pĕrsŏnăblĕ, tūtĕlāry, peĕrāge, trănslātĭon, nŏt, nōte, ăt, āte, tĕn, tĕnd, fŭll, cŭll.

RHYTHM is the harmonious arrangement of words in lines of various definite lengths; and is one of the chief elements of metre, the quality, above all others, that distinguishes poetry from prose. Except for the fact that many words are transposed from the regular order in poetical composition, the verses (or lines) of many poems might be written together to form very good prose. The following illustration will suffice:

"Now, when as sacred light began to

dawn in Eden on the humid flowers, that breathed their morning incense, when all things that breathe, from the earth's great altar, send up silent praise to the Creator, and his nostrils fill with grateful smell, forth came the human pair."

This passage is, in some respects, good prose, but, when rearranged into the lines of Milton's great poem, the effect of rhythm is at once discerned. Thus:

"Now, when as sacred light began to dawn
In Eden on the humid flowers that breathed
Their morning incense, when all things that breathe,
From the earth's great altar, send up silent praise
To the Creator, and his nostrils fill
With grateful smell, forth came the human pair."

Among examples of rhythmic lines, we may choose the following:

"The willow léaves that dánced in the breéze."

"Fúll mány a glórious mórning háve I seén
Flátter the moúntain-tóps with sóvereign eye."

"Seé the dáy begins to breák."

"Léssons sweét of spríng retúrning."

"At the clóse of the dáy, when the hámlet is stíll."

RHYME is the correspondence of the final sound in a metrical line, with those of one or more other lines preceding or following, immediately or alternately. It is distinguished into assonance and consonance; the former being the correspondence of the vowel sounds alone, the latter of both vowels and consonants. Example:

"The baron he stroakt his dark-brown cheeke,
And turned his heade *asyde;*
To wipe away the starting teare
He proudly strave to *hyde.*"

"Have owre, have *owre,* to Aberd*our,*
It's fiftie fadom de*ip,*
And thair lies guid Sir Patrick Spen*ce,*
Wi' the Scots lords at his fe*it.*"

"My cloake it was a very good clo*ake,*
It hath been alwayes true to the *weare*
But now it is not worth a gro*at;*
I have had it four-and-twenty *yeere.*"

Single and double rhymes are also to be distinguished. Example:

"The Abbot had preached for many *years,*
With clear articu*lation,*
As ever was heard in the House of *Peers,*
Against Emanci*pation.*
His words had made battalions *quake,*
Had roused the zeal of *martyrs;*
Had kept the Court an hour a*wake,*
And the king himself three-*quarters.*"

ALLITERATION is the commencement of two or more words, in the same or adjoining lines, with the same or closely allied sounds. Example:

"The parted bosom clings *to* wonted *h*ome,
If aught that's *k*indred cheer *the* welcome *h*earth;
He that is *l*onely, *h*ither *l*et *h*im roam,
And gaze *com*placent on *con*genial earth,
Greece is no *l*ightsome *l*and of social mirth:
But *he whom S*adness *s*ootheth may abide,
And scarce *r*egret the *r*egion of his birth,
*W*hen *w*andering slow by Delphi's *s*acred *s*ide,
Or gazing o'er the *p*lains, where *G*reek and *P*ersian died."

SPECIMENS OF THE PRINCIPAL ENGLISH METRES

IN ORDER to distinguish the different kinds of metre, certain names are borrowed from the prosody of Latin and Greek. They are the Iambic, Trochaic, Dactylic, and Anapestic, and, although in the classical languages, particularly Greek, the distinction of long and short vowels, composing the *feet* of such metres, was definitely discriminated, they may be used in English as combinations of accented and unaccented syllables—our vowel lengths being seldom distinguished.

Thus, an accented syllable preceded by one unaccented is regarded as equivalent to a long syllable following a short one, and is called an *Iambic.* Ex. "Awáy, or ăwāy; rejóice, or rējoīce." An accented or long syllable before an unaccented or short one, is called a *Trochee.* Ex. "Wrétched, or wrētchĕd; rísing, or rīsing." An accented syllable followed by two unaccented is called a *Dactyl.* Ex. "I'ndustries, or ĭndŭstrĭes; éxquisite, or ĕxquĭsīte." An accented syllable following two unaccented is called an *Anapest.* Ex. "Lochinvár, or Lŏchĭnvār; cavalíer, or căvălīēr." Some authorities distinguish another metre in English poetry; the *Amphibrach,* consisting of a long, or accented, syllable both preceded and followed by a short, or unaccented, one. It is probable, also, that the *spondee,* consisting of two long, or accented, syllables, should be occasionally distinguished, particularly in imitations of the Latin *dactylic hexameter,* in which, according to rule, it must always end a line. A *troche* is often used at this point in English verse, as in Longfellow's "Evangeline."

The most common metres are varieties of the iambic, the trochaic, and the anapestic: the differences consisting in the number of iambics, etc., in each line. Further differences arise out of the various kinds of

lines, and the manner in which they are grouped so as to form the stanzas. According as there are one, two, three, four, five, six or seven feet in a line we have a *monometer, dimeter, trimeter, tetrameter, pentameter, hexameter or heptameter.* However, in many poems, principally hymns, intended to go with particular tunes, the distinction is based on the number of syllables composing the lines, frequently irrespective of the nature of the feet. This explains why one hymn of a given number of syllables per line may be sung to a certain tune, while another of the same number does not suit it at all.

Several authorities on English poetry use a peculiar notation to designate the various kinds of metres; using the letter *a* for an accented syllable, and *x* for an unaccented syllable. Thus, *ax* is written for a trochee; *xa,* for an iambic; *xxa,* for an anapest; and *axx,* for a dactyl. A trochaic dimeter becomes 2 *ax;* an iambic tetrameter, 4 *xa;* an anapestic pentameter, 5 *xxa;* a dactylic hexameter, 6 *axx,* etc.

VARIETIES OF VERSE.—Under the various orders of metre the following examples may be given:

I. IAMBIC METRE

(4 s.—2 *xa.*)

"With rávisht éars,
The mónarch héars;
Assúmes the gód,
Affécts the nód."

(6 s.—3 *xa.*)

"What thóugh light Phœ'bus' beáms
Refrésh the soúthern gróund,
And thóugh the príncely thrónes
With béauteous ny'mphs abóund."

(8 s.—4 *xa.*)

"And máy at lást my wéary áge
Find oút the peáceful hérmitáge,
The háiry gówn and móssy ríll."

Heroic. (10 s.—5 *xa.*)

"Such swéet compúlsion dóth in músic lie,
To lúll the dáughter óf necéssity',
And kéep unstéady náture tó her láw,
And thé slow wórld in méasured mótion dráw."

Alexandrine. (12 s.—6 *xa.*)

"A cónstant máiden still she ónly díd remáin,
The lást her génuine láws which stoútly díd retáin."

(14 s.—7 *xa.*)

"If whén aboút the silver móon, when air is frée from wind,
And stárs shine cléar: to whóse sweet béams, high próspects, ánd the bróws
Of áll steep hílls and pínnacles, thrust úp themsélves for shóws."

The most frequent combinations of iambic metres are those exemplified in the following stanzas:

1. Short. (6 s. 8 s.—3 *xa.* 3 *xa.* 4 *xa.* 3 *xa.*)

"Thou knów'st that twice a dáy
I've bróught thee, ín this cán,
Fresh wáter fróm the rúnning broók,
As cleár as éver rán."

2. Common. (8 s. 6 s.—4 *xa.* 3 *xa.* 4 *xa.* 3 *xa.*)

"Of á' the áirts the wind can bláw,
I déarly like the wést;
For thére the bónnie lássie lives,
The lássie I' lo'e bést."

3. Long. (8 s.—4 *xa.* 4 *xa.* 4 *xa.* 4 *xa.*)

"O thoú by whóse expréssive árt
Her pérfect ímage náture seés,
In únion with the Gráces stárt,
And sweéter by' refléction pleáse."

II. TROCHAIC METRE

(3 s.—1 *ax.* + *a.*)

"Hére we máy
Thínk and práy
Béfore deáth
Stóps our breáth."

(4 s.—2 *ax.*)

"Rich the treásure,
Swéet the pleásure."

(5 s. 6 s.—2 *ax* + *a.* 3 *ax.* 3 *ax.* 3 *ax.*)

"Fill the búmper fáir,
E'very dróp we sprínkle
O'n the brów of cáre,
Smoóthes awáy a wrínkle."

(7 s.—3 *ax* + *a.*)

"Lóve is húrt with jár and frét,
Lóve is máde a váin regrét.
E'yes with ídle teárs are wét.
I'dle hábit línks us yét."

(8 s.—4 *ax.*)

"Bind the séa to slúmber stílly,
Bind its ódor tó the lily,
Bind the áspen né'er to quíver,
Thén bind Lóve to lást for éver."

The most common use of this metre is in quatrains (or stanzas of four lines) of seven syllables.

There is an almost infinite variety of metres and of stanzas, produced by the intermixture of iambics and trochees, and of iambic with trochaic metres.

III. DACTYLIC METRE

The following specimen will suffice for the illustration of the varieties of this metre:

(10 s. 6 s. 4 s.—3 *axx* + *a.* 2 *axx.* *axx* + *a.*)

"Hád I a cáve on some wild distant shóre,
Whére the winds hówl to the wáves' dashing roár;
Thére would I weép my woes,
Thére seek my lóst repose,
Till grief my éyes should close,
Ne'ér to wake móre."

IV. Anapestic Metre.

The effect of this metre can be learned from this illustration:

(12 s. 11 s.—4 *xxa.* *xa* + 3 *xxa.*)

"I have lóst for that faíth more than thoú canst bestów,
As the Gód who permíts thee to prósper doth knów;
In his hánd is my heárt and my hópe; and in thíne,
The lánd and the life which for him I resign."

Rules of Metre; Accent.—I. Since the long and short vowels are not distinguished in our language, and the same word may have the stress of the voice in one line and be subordinate in another, it follows that the matter of *accent* is the first and most important consideration in English verse. Therefore, *in good poetry the proper accent of a word should never be changed.* The effect of rhythmatic unity obtained by this means is most often at the expense of other poetic qualities. One example, selected from an old religious poem, illustrates this very well:

(8 s. 6 s.—4 *xa.* 3 *xa.*)

"None bút a fóolish fánatíc,
Of wéak and símple bráins."

As will be observed, the word, "fanatic," which is properly accented on the *second syllable,* has that syllable unaccented in the first verse, being accented on the first syllable, which is impossible and grating.

Another glaring example of this error occurs in that grand old hymn, "The New Jerusalem":

(8 s. 6 s.—4 *xa.* 3 *xa.*)

"There bé the prúdent próphets áll,
Th' apóstles síx and síx,
The glórious mártyrs in a rów,
And cónfessórs betwíxt."

In the last verse, the word, "confessors," which properly carries the accent on the second syllable, has it thrown upon the first, which is even worse in effect than the similar error noted above.

II. The accent, as far as possible, should be kept off of short words, like prepositions and articles, and off of adjectives, unless the sense requires emphasis: although a pleasing effect may sometimes be produced by accenting a preposition at the beginning of a line. A distressing case of ill-effect from this cause occurs in Longfellow's "Robert of Sicily":

(10 s.—5 *xa.*)

"And whén, once móre, within Palérmo's wáll,
And séated ón the thróne in his great háll."

The error lies in the stress thrown on *his* in the second line.

Rules of Metre; Auxiliaries.—III. The use of auxiliaries, particularly parts of the verb, "to do," should be avoided, probably under all circumstances. Although in prose it is perfectly proper to use this verb in emphatic expressions—as, "You *did* say it"—or in negative sentences—as, "I *did* not say it"—either construction is extremely inelegant in verse. It is, in fact, very nearly the best evidence of an insufficient knowledge of the language and of the nature of poetic composition; and, quite apart from consideration of subjects treated, is the principal difference between true verse and "doggerel rhymes." Several glaring examples of this fault occur in the hymn already quoted:

"There, there the choir of angels sing;
There the supernal sort
Of citizens, which hence are rid
From dangers deep, *do* sport."

Again:

"Young men and maids that here on earth
Their pleasures *did* resist."

And:

"Whom I *do* love, to him myself
In glory will appear."

Rules of Metre; Transposition.—IV. Although poetical composition requires some transpositions from the natural order of English prose, such transpositions should never depart so far from the regular arrangements as to render the meaning obscure; nor should a subordinate word, such as a preposition, or an auxiliary verb, end a line. A case in point is as follows:

"Whom now as in a glass I see,
There face to face I shall."

The subject and direct object of a verb—in fact, all words closely related in the formation of an idea—should be placed as closely as the unities of the metre will allow. That it is ever necessary to separate the organic words of a sentence as widely as is sometimes done, is doubtful. A notable evidence of this is found in the poems of Tennyson, which are conspicuous for compactness of expression, grammatical accuracy, and rhetorical force, combined with a complete mastery of metrical unities.

The practice of placing an adjective after the noun with which it agrees is frequently found in the best poets. It is doubtful, however, whether it is really elegant and forceful, and should be avoided wherever possible: it should always be avoided with monosyllabic adjectives. In verses intended to be humorous or vividly descriptive, an exception may be allowed at times. The best general rule, however, is that an ad-

jective in direct agreement with a noun should be placed before it, except in cases where inversion would be permissable in prose; as "life eternal," "God Almighty," etc. Such concessions to grammatical form as "his wife so good," for "his good wife," are inadmissible in real poetry.

The effect of violating these rules may be judged from the following stanza:

"'O Father dear,' quoth He, 'let them
Which Thou hast *put* of old
To me be there where, lo, I am,
Thy glory to behold;
Which *I* with Thee before the world
Was made, in perfect wise,
Have had; from whence the *fountain great*
Of glory *doth arise.*'"

The italics mark the most glaring departures from pure diction and good effect.

Practical Points on Scansion.—It is necessary to scan, either by knowledge of metrical elements, or by correctness of ear and rhythmic sense, just as singing or playing a musical instrument requires either a knowledge of notes or a good memory for melody. In order to discover the metrical character of a given line, it is frequently necessary to compare it with some other whose metre is known, or to try each variety of *foot* in turn until one is found giving the correct accents of all words to the end of each verse (line).

Bearing in mind that a "long," or *accented,* syllable corresponds to the musical quarter-note, or *crochet,* and a "short," or *unaccented,* syllable to the eighth-note, or *quaver,* one can gain some idea of the stress required by each, whether the line is to be sung or not. A very good illustration of this may be seen in the two following twelve-syllable verses from two familiar hymns:

"At the cross, at the cross, where I first saw the light."

And:

"In the cross, in the cross, be my glory ever."

The first scans easily, the accents falling as regularly as in simple prose:

"At the cróss, at the cróss, where I first saw the light."

But to attempt the same metre with the second produces a disarrangement of the natural accents, let alone the confusion to the following verses. Thus:

"In the cróss, in the cróss, be my glóry evér."

The impossible stress on the second syllable of *ever,* gives us the alternative between reading the line as 3 $xxa + xa$, giving:

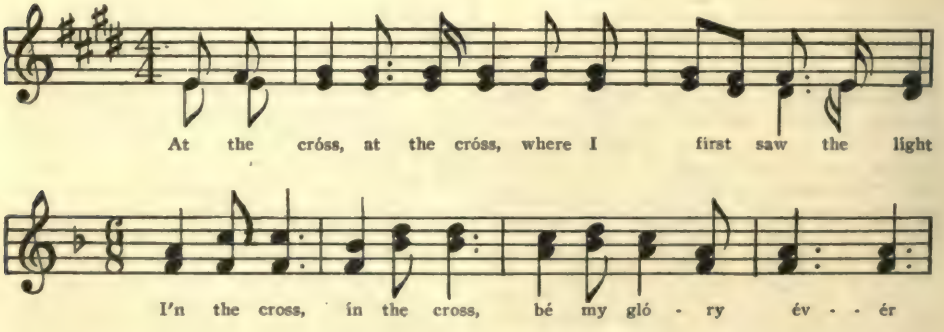
"In the cróss, in the cróss, be my glóry é'er,"

Thus changing it by abbreviation, or of adopting *dactyls* and *trochees* instead of *anapests.* Thus, we have:

"I'n the cross, in the cross, bé my glóry éver,"

or 2 axx + 3 ax, or, as the music seems to indicate, 2 $axx + 2\,ax + aa$, giving a *spondee* in the last foot.

The music written for these two lines reveals the accuracy of our analysis. Thus:



In these lines it will be seen that the time indicated by the musical notation involves the same order of stress and pause as occurs when merely reading the verses.

Irregular Metres. — While in most hymns and ballads, and generally in extended poems, the metre is moderately regular—so that the compositions may be set to simple tunes—some descriptive poetry is very irregularly scanned. This is due either to carelessness or the necessities of using varying feet for varying ideas, but in either case reveals the great flexibility of English verse. That it would be ex-

ceedingly difficult to set some such verses to music is evident: but, for purposes of animated description, it is unsurpassable. A good example of this mixed, or irregular, verse may be found in Whittier's "Barbara Frietchie":

"U'p from the méadows rich with córn,
Cléar in the cóol Septémber mórn,
The clústered spíres of Fréd'rick stánd,
Green-wálled by the hills of Márylánd."

The rhymic construction of these four verses may be understood by the following analysis:

$|axx|ax|ax|a|$
$|axx|ax|ax|a|$
$|xa|xa|xa|xa|$
$|xa|xxa|xa|xa|$

By reading such a scheme as this, letter by letter, giving particularly strong emphasis to each *a*, and leaving each *x* correspondingly weak, a distinct idea of narrative is derived from the metre. The effect is similar to that obtained in some musical compositions, known as "Romances," which move precisely as though a story were being told, the effect of beauty or grandeur, suggestive of more or less distinct scenes and emotions, being supplied by the time and tone-coloring. This merely examples the fact that certain metres, in both poetry and music, are peculiarly adapted to express and excite certain definite emotions.

METRE; EMOTIONAL EFFECTS.—Just as certain styles of musical composition—those combining particular varieties of time and rhythm—are peculiarly suggestive of certain definite emotions, so certain metrical elements in poetry are as well calculated to express them. In general, the fewer the syllables, or the more the feet, in a line, the better fitted it is to set forth deep emotions or give impressive descriptions. Thus we find that the "heavier" portions of a poem are expressed in lines of few syllables or many feet—each foot consisting most often of but two syllables. Lines of fewer feet, or more syllables, are calculated to express lighter varieties of emotion, such as joy, delight, etc. For this reason, the hymns most popular in religious worship are usually written with short lines that may be sung readily to simple and attractive melodies. Changes of emotion may also be expressed by changes of metrical construction and length of lines, just as the *theme* of a musical composition—like Chopin's "Funeral March"—changes at intervals, or as a different metre is taken for the *chorus* or *refrain* in most songs, religious and popular.

To the end, then, of depicting varying emotion, or of making a definite emotional picture, many poems are written in what is called *mixed verse*, each stanza being composed of several varieties of metre. A few examples will suffice to show what is meant:

"Three fishers went saíling awáy to the Wést,
Awáy to the Wést as the sún went dówn;
Each thóught on the wóman who lóved him the bést,
And the chíldren stood wátching them óut of the tówn;
For mén must wórk, and wómen must weép,
And there's líttle to eárn, and mány to kéep,
Though the hárbor bar bé moáning."

This particular form of stanza would scarcely be chosen to express a trivial or comic subject, although it could not be said that its construction necessarily implies tragedy. There are so many successful examples of verse, in every length and every variety of metre, used to express emotions diametrical to those supposed to belong to them, that it is nearly impossible to assert that any particular form necessarily belongs with any particular emotion. We may distinguish, however, between verses merely *descriptive* or *reflective* in character and those that are animated, or fitted to depict some feeling. Thus, few would attempt to express a comic or emotional poem in the metre of "Paradise Lost," or in the dactylic hexameter of Longfellow's "Evangeline." On the other hand, descriptive and reflective words would go very ill with such a metre as the following:

"Let me have a scarlet maple
For the grave-tree at my head,
With the quiet sun behind it,
In the years when I am dead.

. . . . . .

"Let me have the Silent Valley
And the hill that fronts the east,
So that I can watch the morning
Redden, and the stars released.

. . . . . .

"Leave me in the Great Lone Country,
For I shall not be afraid,
With the shy moose and the beaver,
There within my scarlet shade."

This variety of verse seems well adapted to hortatory or discursive subjects.

METRE; MUSICAL QUALITY.—The emotional quality of a metre may be judged when it is used with words in a foreign language. Thus, from the German:

"Im wunderschönen Monat Mai,
Als alle Knospen sprangen,
Da ist in meinem Hertzen
Die Liebe aufgegangen.

"Im wunderschönen Monat Mai,
Als alle Vögel sangen,
Da hab' ich ihr gestanden,
Mein Sehnen und Verlangen."

Few could doubt that this is precisely what it is—a love ditty.

Take this poem from the Latin, and judge whether its meaning is religious or "worldly":

"Tribus signis
Deo dignis
Dies ista colitur:
Tria signa
Laude digna
Cœtus his persequitur.
Stella magos
Duxit vagos
Ad præsepe Domini;
Congaudentes
Omnes gentes
Ejus psallunt nomini."

The following stanza in the Persian seems to possess a distinct power of suggesting emotion:

"Janan-i-man baman biyarid
In mudahtanam bâdo miyarid
Agar boosa zanad bar in labânam
Ta zindah shavam! ajab madarid."

Several authors, undoubtedly skilled in the use of metres, notably Edward Lear and "Lewis Carroll," have well displayed the emotional qualities of certain metres by arranging them with nonsensical words.

Varieties of Stanza.—Most modern poetry is arranged into collections of lines—somewhat like paragraphs in prose—called "stanzas." In popular parlance the stanza is incorrectly called a verse, probably from the Scriptural divisions of "chapters and verses." The word, "verse," refers properly to the single line. It is from the Latin word *vertere*, "to turn," and designates the point where the metre *turns*, or where the eye *turns* back to begin another complete element of the poem.

Properly speaking, a single line can not constitute a poetic unity, although it may be poetical in conception and metrical in form. Two rhymed lines, of whatever length or metre, constitute a *couplet* or *distich*. Thus:

"'Tis the place, and all around it, while as yet
'tis early morn;
Leave me here, and when you want me, sound
upon the bugle horn."

A stanza of three rhymed lines is called a *triplet*. Thus:

"Thy silver locks, once auburn bright,
Are still more lovely in my sight
Than golden gleams of orient light."

A stanza of four lines is called a *quatrain*. Generally the rhyme is between the alternate lines—the first rhyming with the third, and the second with the fourth; or the second and fourth rhyming together, leaving the first and third unrhymed—very seldom, between the four lines consecutively. There are several pleasing variations from common practices. Thus, Tennyson's "In Memoriam" is composed of quatrains having the first and fourth and the second and third lines of each in rhyme:

"I held it truth, with him who sings
To one clear harp in divers tones,
That men may rise on stepping-stones
Of their dead selves to higher things."

Another famous form of quatrain, in which the first, second, and fourth lines rhyme, leaving the third unrhymed, is borrowed from the Persian. This from Omar Khayyam's "Rubaiyat":

"A book of verses underneath the bough,
A jug of wine, a loaf of bread—and Thou
Beside me singing in the Wilderness—
Oh, Wilderness were Paradise enow!"

Seven and Eight Line Stanzas.—Among other special forms of the stanza may be mentioned the so-called "Rhythm-Royal," or seven-lined stanza, invented by Chaucer. It is properly always written in *iambic pentameter*, and has the first and third, the second, fourth, and fifth, and the sixth and seventh in rhyme. Another form of iambic pentameter is the "Ottava Rima," or eight-lined stanza, of Italian origin. It has the first, third, and fifth, the second, fourth and sixth, and the seventh and eighth in rhyme. The following is an example:

"'Tis sweét to heár the wátchdog's hónest bárk
Bay deép-mouth'd wélcome ás we dráw near
hóme;
'Tis sweét to knów there is an éye will márk
Our cóming, ánd look brighter whén we cóme;
'Tis swéet to bé awákened by' the lárk,
Or lúll'd by fálling wáters; swéet the húm
Of bées, the voice of girls, the sóng of bírds,
The lisp of children ánd their eárliest wórds."

The Spenserian Stanza.—The famous "Spenserian Stanza" is also in *iambic pentameter*, with the last line in *hexameter*. It has nine lines, the first of which is in rhyme with the third; the second with the fourth, fifth, and seventh, and the sixth with the eighth and ninth. Thus:

"The Níobé of nátions; thére she stánds,
Chíldless and crównless, ín her voíceless wóe;
An émpty úrn within her wíther'd hánds,
Whose hóly dúst was scátter'd lóng agó;
Her Scípio's tómb contáins no áshes nów;
Her véry sépulchrés lie ténantléss
Of théir heróic dwéllers: dóst thou flów,
Old Tíber, thróugh a márble wildernéss?
Rise, with thy yellow wáves, and mántle her dístréss!"

THE SONNET is a fourteen-line stanza also written in *iambic pentameter*. It is divided into two distinct parts, or members: the one, consisting of the first eight lines, being called the "major member," or *"octave"*; the other, the remaining six lines, being called the "minor member," or *"sestette."* The major member is, in construction, two quatrains, in each of which the rhymes are between the first and fourth and the second and third lines, as in the stanzas of "In Memoriam." In order, however, to make the unity of this member complete, the first and fourth lines of the first quatrain are in rhyme with the first and fourth of the second; and the second and third lines of the first, with the second and third of the second.

The minor member, or *sestette*, forms a unit by itself, independent, so far as rhyme is concerned, from the *octave*. There is no invariable rule for the arrangement of rhymes between its verses, although the prevailing—perhaps the typical—arrangement is to rhyme the first with the fourth, the second with the fifth, and the third with the sixth. The continuity between the major and minor members is usually secured by beginning the latter in the midst of a sentence, or by otherwise forming a logical or grammatical reference to the ideas developed in the former.

A number of poets, particularly in America, have produced fourteen-line stanzas in iambic pentameter, and have called them sonnets. However, on account of the fact that the sequence of the rhymes is somewhat different from that named above—the octave generally consisting of two distinct quatrains, with the rhyme between the first and fourth and the second and third lines of each, and no rhyme from the one being carried over to the other—many authorities contend that the "American sonnet" is not properly named.

The following sonnet from Lowell departs from the scheme of the *sestette* mentioned above, in having the rhymes between the first, third, and fifth, and the second, fourth, and sixth lines. It is a true sonnet, however, from the fact that the construction of the *octave* is perfectly regular.

TO A FRIEND

"True as the sun's own work, but more refined,
It tells of love behind the artist's eye,
Of sweet companionships with earth and sky,
And summers stored, the sunshine of the mind.
What peace! Sure, ere you breathe, the fickle wind
Will break its truce and bend the grass plume high
Scarcely yet quiet from the gilded fly
That flits a more luxurious perch to find.
Thanks for a pleasure that can never pall,
A serene moment, deftly caught and kept
To make immortal summer on my wall.
Had he who drew such gladness ever wept?
Ask rather could he else have seen at all,
Or grown in Nature's mysteries an adept?"

ELEGIAC VERSE.—One other use of the *iambic pentameter* is in elegiac verse, where it frequently appears in the form of quatrains. Thus from Gray:

"Here rests his head upón the láp of eárth,
A yoúth to fórtune ánd to fáme unknówn;
Fair science smíled not ón his húmble birth,
And mélancholy márk'd him fór her ówn."

THE USES OF POETRY.—Some people assert that the day of poetry has passed. If they mean that the lengthy poems of former times, such as the "Paradise Lost," and the epic of the classic languages is no longer widely read, they have some element of fact in their contention. For the shorter poems; the ballad, the descriptive verse, songs, hymns, and the like, there is still a demand and an appreciation; and this will probably continue to be the case so long as humanity appreciates rhythm and rhyme, as helps to imagination, memory, and even understanding, and so long as an idea, trivial and irrelevant in prose, can gain force and logical cogency through the medium of verse.

Although poetry, like music, the drama, sculpture, and the other arts, has seen its widest and greatest use as a "handmaid of religion"—serving as a vehicle for expressing the loftiest thoughts and aspirations of mankind, and perpetuating the memory of its best and noblest achievements—it can not be held at the present time that this is its sole and exclusive function. Apart from its wide use in expressing human love, the bulk of present-day poetry is occupied with the homelier aspects of life; with simple narratives or descriptions, and with subjects classed as comic or humorous. That such productions are poetry, in the sense of using properly constructed metres and effective language, is often preeminently true. That the ideas conveyed by them are "poetic"—that is to say, "ideal," ennobling, worthy of preservation in the beautiful unities of metre—is frequently doubtful.

If art is to be expressive, it must also be broad, inclusive, catholic, like nature it seeks to imitate; although its uses, on occasions, may be higher or lower, worthier or unworthier. However, these distinctions apply to the subjects treated, not to the art that expresses them.

ENGLISH WORDS OF FOREIGN ORIGIN

THERE is an old saying to the effect that "language is history crystallized," which means that a critical study of words and idioms will reveal most, if not all, the foreign influences that have been brought to bear upon a people in the course of history. Thus, the modern Greek, in addition to numerous idioms and constructions not found in the ancient language, has very many Turkish words that distinctly reveal the close and painful connection subsisting for so many years between the two nations. So, also, the Greek of the New Testament contains so many constructions peculiar to Hebrew that the nationality of its writers is too evident for denial: its language is the best evidence of its genuineness. What is true in these connections applies with even greater force to the English language. The Romans, the Saxons, the French, have all left monuments of their influence in the words we daily use to express our thoughts, our aspirations, and our necessities.

In a certain sense it is true, therefore, that an exhaustive understanding of English requires a training in several classical and foreign languages. However, by intelligent study, one need not "go abroad to learn his own tongue." The matter of word-derivation and construction is so simple that a very definite and practical idea of its principles may be readily acquired. These will be set forth in the following pages, in such shape as to simplify study, as far as is possible, for average intelligence and application.

ANALYSIS OF ENGLISH WORDS

ELEMENTS OF WORD-STRUCTURE. —Every word has two and very many have all, of three elements. The *first* is the root, which is the simplest and most primitive sound to which a definite meaning may apply in any given case. The *second* is the suffix, or ending, which determines to what part of speech a word belongs—whether it is a noun, concrete or abstract, an adjective, an adverb or a verb. The *third* is the prefix, which always stands at the beginning of a word, and modifies the meaning. One root word, combined with the same suffix, may in several different cases have as many diverse meanings, owing to the presence of a different prefix in each case. Thus, from the Latin verb, *tendere,* to stretch or strive, we have the words: *at*tention, *con*tention, *dis*tention, *ex*tension, *in*tention, *pre*tension, with as many different meanings, as need not be explained. In the same manner, from the Latin, *trahere,* to draw or pull, we have the words: *abs*traction, *at*traction, *con*traction, *de*traction, *dis*traction, *ex*traction, *pro*traction, *re*traction, *sub*traction. In order to understand the widely various meanings to be supplied by a single root-word—such as *ten* or *tend,* as in the above

cases—it is necessary that one know (1) the meaning of the root in each instance and to be able to identify it in any word; (2) the grammatical significance of the suffix; (3) the force of the prefix. The significance of the word in hand may then be reasoned out, in the majority of cases, without consulting the dictionary.

Compound Words.—Before proceeding to the study of prefixes, suffixes, and roots, it is necessary, perhaps, to mention another class of words, known as "compound words." With these words, syllables *apparently* prefixes or suffixes vary the meaning as in the cases just noted; but that they are not prefixes or suffixes in the accepted sense of the terms is due to the fact that two roots are combined into one idea, rather than one root, with a prepositional prefix. This is shown in the use of pure English words. Thus, from the verb, *see,* we have *fore*see and *over*see, with the prepositional prefixes *fore* and *over,* as shown; their office in either case being to tell *how* one sees. With such a compound word as *sight*seer, however, the word *sight* is prefixed to *seer,* in order to tell *what* one sees.

Thus, from the Greek word, *metron,* a measure, we have the compounds, geometer, barometer, chronometer, and thermometer; signifying, respectively, "earth-measurer," "air-measurer," "time-measurer," and "heat-measurer." These all tell *what* is measured. If we use Greek prefixes, making such words as *dia*meter, "a measure through," *peri*meter, "a measure around," and *sym*metry, "a measuring-with, an agreement," we have words telling *how* the measuring is done. The significance of compound words derived from foreign languages can best be judged after the meanings belonging to the various roots have been found and understood.

Rules on Forming Words.—A fundamental rule applying alike to the use of prefixes and suffixes and to the formation of compound words, is that all the elements of a word—prefix, suffix, root, and compounded root—shall be derived from the same language. This rule is invariable, except where all the elements of the compound have become so thoroughly a part of the common stock of English words as to be combined with other roots and elements of English compounds. That this is the case is fortunate for the student of words, preventing many errors that seem natural. Thus, we have in English the prefix, *mis,* as in *mis*place, *mis*lead, *mis*take, etc., having the meaning of "wrongly" in each case. But, seeing such words as "*mis*anthropist," "*miso*gynist," in which the body of the word is evidently borrowed from the Greek, the student understands that the "*mis*" here must also be a Greek root, and finds it to represent "*misos,*" signifying "hatred." Thus, he derives the meanings "man-hater" and "woman-hater."

PREFIXES

Prefixes in English.—In most languages, except English, the prepositional words, used to modify the meaning of verbs or nouns, are regularly compounded with them as prefixes. This is the invariable rule in Latin and Greek, and holds in German, except in using the separable prefixes, where the modifying preposition or particle is separable from the verbal root. In very many English verbs, so modified, the particle, if of English or Saxon origin, is separate from the word. Thus, we have to put or set *down;* to hang, put, set, move *up;* to look, go, take, walk *over;* to live, run, take *out.* In several cases, also, the verbs, so used with particles, have a meaning opposite to that given, when the particles are prefixes. Thus, "set up," means to "establish, to found, to arrange," while "upset" means "to throw down, to overturn, to throw into confusion": so there is a wide difference between *upsetting* and *setting up.* The word "take over" means "to appropriate" while "overtake" means "to catch, or come up with," in running or walking. "Look over" means to "examine carefully," as a book, an estate, but "overlook" means usually "to ignore," or not to look at, although it also has the force of "to look at from above," as in the expression, "the window overlooks the yard." So also, when we say that one "runs out" or "takes out," we see that the *out* has the force of *from;* but, when one "out-runs" another, he runs faster than that other. Consequently, he may *live out* the allotted "threescore and ten years" of human life, and yet be *outlived* by some one else who survives to "fourscore years." The word, *with,* has a similar story: If I *hold with* another, I am either his partner in holding something, or else I agree with him; or if I *stand with* him I am by his side, or am his ally. If, however, I *withhold* something, I *keep it from* him, and if I *withstand* him, I *resist, oppose,* or *stand against* him. Thus, *with,* as a prefix, has the force of *from* or *against,* which seems peculiar until we consider the fact that "to *with*hold" means "to

hold with or for one's self"; that *"with*-stand" means to "stand with or for one's self *against* another," and that *"with*draw" means to "draw *with* or *by* one's self, away *from* others." As several such uses of foreign prefixes will be encountered, it is well to understand the matter in familiar English words.

SUFFIXES

USE OF SUFFIXES.—A suffix, as already stated, determines the part of speech to which a word belongs. It also varies the force with which it is used and determines the precise meaning to be attributed to it in each case. Most of the important suffixes indicate nouns or adjectives, leaving a very few forms peculiarly verbal.

Among the suffixes used with foreign roots—particularly Latin and Greek—the following list gives the most important, with their forms in the original language. In a large number of cases, it is necessary only to change the suffix to its Latin or Greek form to find the word borrowed into the English. With words of Latin origin borrowed from the French this is not so easy.

ABSTRACT NOUNS

NOUN SUFFIXES are the most numerous, and in nearly all cases retain the original form with sufficient clearness to enable ready translation. They are as follows:

-ACY (Latin, *atio* or *acio;* Greek, *ateia*), denoting the being, condition, office, or function belonging to a given state or quality. Thus, we have accuracy (*accuratio*), obstinacy (*obstinatio*), and curacy (*curatio*) —the *c* in nearly all cases representing the Latin *t*.

-ANCE, -ANCY, -ENCE, -ENCY (Latin, *antia* and *entia*) have a similar meaning, as in ignorance, arrogancy, impudence, innocency.

-ICE (L. *itia*), also an abstract, as in avarice, justice, malice.

-ION, -TION (L. *io, ionis, tio, tionis, sio, sionis*), as in aberration, expulsion, precision.

-ITY and -TY (L. *itas* and *tas*), as in antiquity, hostility, sublimity. Some such words are derived direct from the French, as amity (Fr. *amitié*, L. *amicitia*).

-MENT (L. *mentum*), as in fragment, aliment, ligament. Most English words with this suffix are either adapted from French, or are from English roots.

-MONY (L. *monium*), as in matrimony, patrimony, testimony, parsimony, sanctimony. The first three nouns have departed from the original abstract significance, which is represented by the last two.

-TUDE and -UDE (L. *tudo* and *udo*), as in altitude, beatitude, fortitude.

CONCRETE SUFFIXES

-CULE, -CLE, -ULE (L. *culus, ulus*) have the force of diminutives, as in animalcule, spicule, etc.

-IC, -ICS (Gr. *ikon*, plural, *ika*). The first is an adjectival termination most often used for nouns, and generally used with a plural form and a singular significance Thus, we have music (something pertaining to the Muses), physic (medicine), dialectic (logic); but ethics, metaphysics, economics, optics, all of Greek origin.

-ISM (Gr. *ismos*). This suffix, very largely used to form the names of sects, cults, and religions, as Buddhism, Calvinism, Catholicism, etc., was originally used in Greek for nouns derived from verbs ending in *izo* (1*st pers. pres. ind.*), and serves the same purpose in English with nouns from many verbs in *ize*, as catechism (from catechise), dogmatism (from dogmatize), systematism (from systematize). Its use with a Greek root, as in these cases, generally indicates such a derivation.

-IST (Gr. *istes*) properly indicates a derivative of a verb in *izo* (ize), but is used with a large number of words of purely English and modern origins. Its force is, in all cases, "one who is, does, or works at" the thing indicated by the root-word.

-ITIS (Gr. *tis*) indicates a noun or adjective-noun derived from a fundamental word having the same root. It has the force of "something belonging to, like, etc.," but is used in English to signify an inflammatory disease, as laryngitis, peritonitis, etc.

-OR (L. *or*) is only the Latin counterpart of the English *er*, signifying "one who does." Thus we have in English the pure Latin words, actor, auditor, collector, factor, doctor, juror, victor. In fact, most, if not all, words with this suffix are borrowed direct from the Latin.

-URE (L. *ura*) is a suffix akin to the participle in *rus*, properly the future participle, and has the force of "done" or "to be done," the word to which it is joined being in form the *stem* of the past participle. Thus, we have picture, creature, scripture, rapture, capture, rupture. We have, also, mixture, seizure, pleasure, etc., not directly derived from Latin; showing that this suffix is very nearly adopted as a true English termination. It also occurs as a verb and adjec-

tive suffix, as in secure, procure, endure, etc.

-Y (L. *ia, ius;* Gr. *ia, ios, eia, eios*), in such proper names as Italy (Italia), Livy (Livius), Pliny (Plinius), and in such common nouns as philosophy (*ia*), orthoepy (*eia*), prosody (*ia*). The adjective suffix, *y*, as in bloody, dirty, oily, etc., does not seem to have a direct classical origin.

-LOGY and -OLOGY (Gr. *logos*). This word, as a terminative member in compound words of Greek origin, has come to have very much the nature of a suffix in English, and is appended to many words and roots of modern origin. It always indicates science of, knowledge of, teaching of, as theology, biology, zoölogy, geology.

ADJECTIVES

ADJECTIVE SUFFIXES.—Among adjective suffixes are a number found also with nouns. That is to say, many adjectives with these terminations are used also as nouns. In this category are four principal suffixes with the common significance of "pertaining, relating, belonging to" the idea or object represented by the root-word. They are:

-ABLE, -IBLE, -BLE (L. *abilis, ibilis*) denote "what may be, can be, or is worthy to be," as in respectable, accessible, flexible, visible, and are used with both Latin and English roots.

-AC (Gr. *akos*) signifies "of, belonging to, pertaining to," as in elegiac, cardiac.

-ACEOUS (L. *aceus*) signifies "like, of, or belonging to," as argillaceous, saponaceous, herbaceous.

-AL (L. *alis*), as in filial, mental, regal, general, national, etc.

-AN or IAN (L. *anus, ianus*), as in Roman, Christian, veteran; although many such words are of English origin, as artisan, librarian.

-ANT and -ENT (Latin participial stems) are used with verbal derivatives, and have the force of "being," or of "one who is or does" that indicated by the root-word to which they are appended; as in tenant, servant, ignorant, ardent, potent, pendent, etc., very many of which are used as both adjectives and nouns.

-AR (L. *aris*) has the force of "relating or belonging to, having," as in circular, insular, angular, titular. It also occurs, as a shortened form of *ary*, as in vicar; as a substitute for *al*, after roots with *l*, as in the above cases; and as a form for *er*, as in beggar.

-ARY and -ORY (L. *arius* and *orius*) seem to differ only by reason of euphony. They give such words as military, pulmonary, temporary, transitory, compulsory; also many nouns, as armory, factory, memory, library, vagary, etc.

-ATE (Latin, *atus*) indicates a verbal derivative with the past participial meanings of "having been," or of "one who has been," as in legate, cognate, curate, delegate; also as a simple adjective termination indicating possession or a state of being, as corporate, fortunate, passionate, desperate; many of both descriptions being used both for nouns and adjectives.

-IC and -ICAL (Gr. *ikos;* L. *icus, icalis*) have the force of "belonging or relating to." These suffixes are often used interchangeably, as with symbolic and symbolical, chemic and chemical; but in several cases involve very different meanings in the words: Thus, politic (tactful, wary) and political (relating to the state)—although we say body politic; classic and classical; economic and economical; philosophic and philosophical, poetic and poetical.

-ID and IDE (L. *idus*) indicates the Latin form of certain adjective endings with a quasi-participial significance of "being or possessing" the quality indicated by the root-word; as acrid, frigid, fervid, horrid, turgid, etc.; also, with chemical terms, as carbide, oxide, sulphide, calcide, bromide, etc., which have a significance peculiar to chemistry.

-INE (L. *inus*) is a derivative termination signifying "of, or pertaining to," as in canine, divine, feminine, marine, etc.

-ITE (L. *itus;* Gr. *tes*) indicates a past participial derivative, or a verb with a past participial form; also nouns with the Greek derivative termination, *te*, like athlete, æsthete, frequently made into *ite*, as in Levite. Among Latin derivatives is favorite.

-IVE (L. *ivus*) is another verbal derivative ending borrowed from Latin, as in captive, fugitive, native, etc., and has the force of "one who has been" or "having been."

-OID (Gr. *eidos*) is a suffix derived from a verbal stem signifying "seeming to be, appearing, like," and is so used in English, principally with Greek roots, as in the words anthropoid (like a man), asteroid (like a star—hence a "little star"), pithecoid (like a monkey), odontoid (like a tooth).

-OSE and -OUS (L. *osus*) signify "full of or consisting of," as in verbose, jocose, grandiose, igneous, fibrous, sonorous; although occasionally, "belonging to, of," as in fallacious, cutaneous, vitreous. These suffixes also terminate many compound ad-

jectives, and some of later origin, such as grievous and murderous.

VERBAL SUFFIXES.—In addition to the verbal suffixes already mentioned—such as *ate* and *ite*—there are several with the general meaning of "to do, to make."

-IZE and ISE (Gr. *izo*) are used very largely with verbs indicating a change in belief, habit, etc., as romanize, Americanize, but frequently has the force of changing a form, as in vulcanize, particularize, generalize. Their derivatives are formed with *ism, ist, ite.* The suffix, *ise,* is sometimes a variation of *ize,* and sometimes indicates a verb of other than Greek origin, often French, allied to verbs in *ice,* as suffice, notice, etc. Thus we have the noun, practice, and the verb, practise. The noun, advice, and the verb, advise.

-FY (Fr. *fier;* L. *fico*), as though a compound from the Latin verb, *fieri, factum,* forms its derivatives with *faction* or *fication* as: satisfy and satisfaction; edify and edification; justify and justification; mortify and mortification. The difference will be explained in connection with the list of roots.

-UTE (L. *utus*) is used with verbs having the Latin past participial stem in English, as persecute, prosecute, institute, most of which are derived from the Latin verbs *sequi, secutus,* "follow," and *statuere, statutum,* "establish."

LIST OF PREFIXES

LATIN AND GREEK PREFIXES.—The most prominent prefixes, used with foreign words in the English language, are given in the following paragraphs, with their more familiar word-combinations. Many of them undergo variation in the process of combining, but these are readily recognized after the rules are understood.

Thus, *a,* signifying "without," becomes *an* before roots beginning with vowels; *ab* becomes *abs* before *t,* and *a* before *v; con* becomes *co* before vowels, *cog* before *n, col* before *l, com* before *b, m,* and *p,* and *cor* before *r; dis* becomes *di* before *g, l, m, s, v; in* becomes *il* before *l, im* before *m, ir* before *r; in* (privative) becomes *ig* before *n, il* before *l, im* before *m* and *p, ir* before *r; ob* becomes *oc* before *c, of* before *f, op* before *p; sub* becomes *suc* before *c, suf* before *f, sup* before *p, sug* before *g, sus* before *t; syn* becomes *sy* before *t, syl* before *l,* and *sym* before *m. Contra* is frequently changed to *counter,* with words of English and French origin; and the Latin *præ* is always spelled *pre.*

In order to render the following list comprehensible to the student, the prefixes are differentiated from the root-words by italics. The suffixes may be recognized.

1.—A or AN occurs properly only with Greek roots corresponding to the Latin *in,* privative, also meaning "without." Among the words in which its use is most familiar are the following: *a*byss (*byssos,* a bottom), *a*narchy, *a*cephalous, *a*nemic, *a*nomalous (*omalos,* like), *a*pathy, *a*septic, *a*theistic, and their derivatives.

2.—AB (L.) has the force of "away or away from," occurring with the following words: *ab*ate, *ab*breviate, *ab*dicate, *ab*erration, *ab*ject, *ab*lution, *ab*rade, *ab*rupt, *ab*sent, *ab*surd, *ab*solve, *ab*stract, *ab*stain, *a*vert, *a*vocation, *a*vulsion.

3.—AD (L.) has the force of "to" or "at," and is used with the following, among very many others: *ad*apt, *ad*ore, *a*scend, *a*spire, *a*ccede, *a*ccept, *a*ffix, *a*fflict, *a*ggravate, *a*ggrandize, *a*lleviate, *a*llude, *a*nnounce, *a*nnul, *a*ppend, *a*ppertain, *a*rrange, *a*rrogance, *a*ssign, *a*ssume, *a*ttend, *a*ttest.

4.—AMBI, sometimes AM (L.), means "around, on both sides," as in *ambi*tion, *ambi*ent, *ambi*guous, *ambi*dextrous, *am*putate.

5.—AMPHI (Gr.) is the correspondent of the Latin *ambi,* and occurs in the following common words, *amphi*bian, *amphi*theatre, *am*phora.

6.—ANA (Gr.) means "up" or "again," also "back." Thus, *ana*dromous means "running up," while *ana*baptist means "one who baptizes again." Among common words formed with this prefix are *ana*logy, *ana*lysis, *ana*tomy, *ana*gram, *ana*state, *ana*thema.

7.—ANTE (L.), "before," occurs in *ante*cedent, *ante*date, *ante*vert, and with many English words and past-Latin compounds.

8.—ANTI, ANT (Gr.), "against, opposed to, opposite," occurs in *ant*arctic, *anti*podes, *anti*pathy, *anti*phon, and a large number of technical and scientific terms.

9.—APO (Gr.), "from, away from," occurs in *apo*state, *apo*stle, *apo*strophe, *apo*logue.

10.—CATA, CATE, CAT (Gr. *kata*), "down, down upon, on," as in *cata*logue, *cate*chism, *cata*rrh, *cate*gory, *cat*holic, *cat*hode.

11.—CIRCUM (L.), "around, about," as in *circum*stance, *circum*scribe, *circum*spect, *circum*ference, *circum*flex.

12.—CON, CO, COG, COL, COM, COR (L.), "with, together," as in *con*cur, *con*nect, *co*equal, *co*here, *cog*nate, *col*lect, *com*pel, *cor*rode, *con*gress.

13.—CONTRA (L.), "against," as in *contra*dict, *contro*vert, *contra*vene, *contra*ry.

14.—DE (L.), "from, out of, away from," as in *de*duce, *de*ject, *de*pose, *de*pend, *de*volve.

15.—DIA (Gr.), "through, apart, between," as in *dia*meter, *dia*logue, *dia*phanous, *dia*gonal.

16.—DIS, DI, DIF (L.), "apart, asunder, away," as in *dis*solve, *dis*tend, *dis*perse, *di*verge, *di*gress, *dif*fer, *dif*fuse.

17.—EN, EM (Gr.), "in, on," the Greek correspondent of the Latin *in*, as in *en*thuse, *em*phatic. The prefix, *em*, is also used with a large number of purely English words.

18.—EPI (Gr.), "upon," as in *epi*logue, *epi*gram, *epi*taph, *epi*demic.

19.—EX, E, EC, EF (L. and Gr.), "from, away from, out, out of," as in the Latin derivatives, *ex*act, *ex*pel, *ex*pose, *ex*tract, *e*dict, *e*mit, *e*merge, *ef*face, *ef*fulgent, and the Greek derivatives, *ec*centric, *ec*stasy, *ec*logue, *ex*odus, *ex*egesis.

20.—EXTRA (L.), "beyond, outside of," as in *extra*mundane, *extra*ordinary, *extra*vagant, *extra*dite.

21.—HYPER (Gr.), "over and above," as in *hyper*critical, *hyper*trophy, *hyper*bole.

22.—HYPO (Gr.), "under," also "less than," as in *hypo*thesis, *hypo*critical, *hypo*dermic.

23.—IN, IL, IM, IR (L.), "in, into, on, upon," as in *in*cline, *in*duce, *in*vent, *il*lumine, *im*port, *im*pose, *ir*ritate, *ir*ruption.

24.—IN, IG, IL, IM, IR (L.), "without, not, un-," as in *in*decent, *in*credible, *ig*noble, *ig*nominious (*i.e.*, unnamable), *il*legal, *il*literate, *im*possible, *im*pudent, *ir*regular.

25.—INTER (L.), "between, among," as in *inter*fere, *inter*lude, *inter*pose, *inter*sect, *inter*vene.

26.—INTRA, INTRO (L.), "within," as *intro*duce, *intro*spection, *intro*vert, *intro*mit.

27.—META, MET (Gr.), "beyond, after, following, according to," as in *meta*phor, *meta*physics, *meth*od, *meta*gastric.

28.—OB, OC, OF, OP (L.), "against, toward," as in *ob*ject, *ob*trude, *ob*solete, *ob*loquy, *oc*casion, *oc*cur, *of*fend, *of*fer, *op*pose, *op*press.

29.—PARA, PAR (Gr.), "beside, like," as in *para*centric, *para*phrase, *par*ody, *para*bola, *par*able, *par*allel.

30.—PER (L.), "through," as in *per*vade, *per*spire, *per*manent, *per*mutate, *per*ennial; sometimes meaning "thoroughly," with an intensive force, as in *per*fect, *per*nicious, *per*plex, *per*jure.

31.—PERI (Gr.), "around, about," as in *peri*meter, *peri*od, *peri*style.

32.—POST (L.), "after," as in *post*pone, *post*script, *post*humous.

33.—PRE (L. *prae*), "before," as in *pre*cede, *pre*dict, *pre*fer, *pre*vent.

34.—PRETER (L. *præter*), "past, beyond," as in *preter*it, *preter*natural.

35.—PRO (L. and Gr.), "for, forth, out, forward," as in *pro*ceed, *pro*mote, *pro*pel, *pro*voke. With Greek roots this prefix has the same meanings, as in *pro*pædeutic, but has also the force of "before," as in *pro*phet, which may mean "one who speaks for or forth or before," with equal correctness.

36.—RE (L.), "again, anew, back," as in *re*act, *re*bel, *re*cede, *re*pel, *re*sume, *re*fuse, and, probably also, *re*ligion.

37.—RETRO (L.), "backward," as in *retro*grade, *retro*spect, *retro*vert, *retro*cede.

38.—SE (L.) has the force of "away, apart from, aside," as in *se*cede, *se*clude, *se*duce, *se*dition. It is probably derived from the third personal pronoun, *se*, "by one's self," whence the meaning "away from" others.

39.—SINE, SIM, SIN (L.), "without," as in *sine*cure, *sim*ple ("without fold"), *sin*cere ("without wax," as pure honey; hence "unmingled").

40.—SUB, SUC, SUF, SUG, SUP, SUS (L.), "under" and "beneath," hence, with many verbs, "up." Thus, *sub*scribe, *sub*tract, *suc*ceed, *suc*cor, *suf*fer, *suf*fuse, *sup*port, *sup*pose, *sug*gest, *sup*plant.

41.—SUBTER (L.), "under," as in *subter*fuge.

42.—SUPER (L.), "over, above," as in *super*pose, *super*sede.

43.—SUR (Fr. for Latin *super*), as in *sur*vive, *sur*face, *sur*rogate.

44.—SYN, SYL, SYM (Gr.), "with, together with," Greek correspondent of the Latin *con*, as in *syn*od, *syn*onym, *syn*tax, *syn*opsis, *syl*lable, *sym*pathy, *sym*metry.

45.—TRANS, TRAN, TRA (L.), "across, over, beyond, through," as in *trans*cript, *trans*fer, *trans*late, *tra*duce, *tra*ject.

ROOTS AND THE CHANGES

DERIVING WORDS FROM ROOTS.—In deriving words from Latin and Greek roots, there are a number of points that must be understood and constantly kept in mind. Among these is the fact that different derivatives from some given root frequently vary in spelling from the model given in the English dictionary, even add syllables to that form. Thus, from *hospes*, a "host," we learn that the words hospitality and hospital are derived, but the origin of the syllable, *it*, is not clear. The explanation is that the root word is *hospit*, as appears in all cases except the nominative, which is

probably abbreviated from *hospitis*. Thus, the genitive is *hospitis*, meaning "of a host," etc. So also from *caput*, "a head," all derivatives, such as capital, decapitate, etc., give the root-word as *capit*, which form is found in the genitive, *capitis*, "of a head," etc.

With verbs the case is the same. Thus, from the verb, *cedere*, "to go, to yield," we have accede, concede, exceed, proceed, precede, etc., but also accession, concession, excess, process, etc. Whence the syllable, *ess?* This is the stem of the perfect participle, which is *cessum*, formed by the same irregularity that gives us the English, thought, from think, instead of "thinked," which should derive according to the general rule.

But the spelling of stems is not the only variation in either nouns or verbs. We have, for example, the verb, *statuere*, from which statue and statute alike derive. When we come to institute, constitute, substitute, we find that the root has been changed from *statu* to *stitu*. This fact is explained by the rule that most verbs with *a* in the root change it to *i*, when preceded by a prepositional prefix. Thus, from *facere*, "to do," we have *efficere, afficere, proficere, perficere*, etc.; from *gradi*, "to step, to go," *progredi, ingredi*, etc.

Again, certain words that seem to be directly derived from Latin have the spelling changed in the process. Such are clear (L. *clarus*), chant (*cantum*), claim (*clamare*). The explanation is that these, and numerous other words, both changed and unchanged, are derived through the French, which corrupted or modified most of the Latin words adopted into its vocabulary. Thus, clear derives from the old French *cler*, now *clair;* chant, from the French *chanter*, and *claim* from the French *claimer*. The same influence transformed the Latin *cadens* into "chance"; *cancella* into "chancel"; *concilium* into "council," etc.

With Greek words the derivation is far more direct, probably because the greater part of them have been added to the language within the last few centuries, and were long used as the common stock of learned dialects.

List of Common Root-Words.

From what has already been said, the student may readily separate the prefixes and suffixes; understand the reasons for most of the common variations in spelling, and be able to identify the roots combined into concrete words. In order to gain a clear understanding of meanings, it will be necessary only to give a list of the roots most commonly used.

In the following list the nouns are given in their root forms, the verbs in their present infinitive and past participle, except where the perfect stem presents variations adopted into English.

ACERB (L. *acerbus*, bitter), as in "acerbity," bitterness; "exacerbate," to make [one] bitter.

ACOU (Gr. *akouo*, I hear), as in "acoustics," the science of sounds; "acoumeter," an instrument to test the hearing.

ACRI (L. *acris*, sharp), as in "acrid," sharp, acid; "acridity"; "acrimony," severity.

ACRO (Gr. *akron*, top, end, summit), as in "acrobat" (one who goes to the summit), an aërial performer; "acromegoly," a disease in which the extremities grow to great size; "acropolis," a high place in a city; "acrostic" (end-line), a stanza so arranged that the first letters of the verses spell a name or phrase.

ACU (L. *acuo, acutum*, to sharpen), as in "acute," sharp, penetrating; "acumen," intellectual sharpness.

AGGER (L. *agger*, a heap—*ad-gerere*), as in "exaggerate," to pile up with words.

ACT, AG, IG (L. *agere, actum*, to do, to act), as in "act," "action," "active," "actor"; "coact," to act with; "counteract," to hinder; "enact," to decree; "exact," precise, accurate, strict; "inaction," rest; "react," to resist act with act; "transact," to perform, as of business, etc.; "agent," one who acts for another; "cogent" (*co-agent*), forcible, convincing; "indigent" (*in-d-agent*), wanting, needy, poor; "navigate" (*navigare*, from *nav-agere*), to manage a ship; "prodigal" (one sent forth or away), spendthrift, wasteful.

AGOG, AGON (Gr. *ago*, I lead), as in "agony," pain, suffering, as in striving or fighting (hence "agonize"); "antagonist," an opponent, one led against; "demagogue," a leader of the people, a popular head; "pedagogue," a leader of children, hence a teacher; "synagogue," a place of coming-together (L. *conventicle*), a Jewish place of worship.

AGRA, AGRI, EGRI (L. *ager, agri*, a field, land), "agrarian," relating to farms; "agriculture," field-culture, farming; "peregrinate," to wander, go through lands.

AL, ALIT (L. *alere, alitum*, to feed), as in "aliment," food; "alimony," allowance for support in divorce cases; "alms"; "almoner," alms-distributor; "coalition" (feeding with), union for mutual interest.

ALI, ALTER (L. *alius, alienus, alter,* another), as in "alias," otherwise; "alien," foreign; "inalienable," not transferable; "alter," to change.

ALG (Gr. *algos,* pain), as in "neuralgia," nerve-ache; "algometer," an instrument to measure pain.

ALL, ALLEL (Gr. *allos,* another; *allelon,* one another), as in "allegory," a parable, a tale leading (*ago*) to something else; "allopathy," a system of treating diseases by drugs producing effects other than its symptoms; "allopylian," of another tribe; "allotropy," chemical property of changing; "parallel," side by side.

ALT (L. *altus,* high), as in "altitude," height; "exalt," to make high.

AM, AMIC (L. *amare,* to love; *amicus,* a friend), as in "amiable"; "amicable"; "inimical," hostile; "amorous"; "enamor"; and through the French, "amity," friendship; "enmity," hatred; "amour," a love affair; "amateur," one who follows an art or occupation for love of it.

ANG, ANX (L. *angere, anxum,* to vex or annoy), as in "anger," "anguish," "anxiety."

ANGEL (Gr. *aggelos,* a bearer of tidings), as in "angel"; "evangel" (good tidings), the gospel; "evangelist."

ANGL, ANGUL (L. *angulus,* an angle), as in "angle," "rectangle," "triangle," "angular," etc.

ANIM (L. *anima,* breath; *animus,* mind, courage), as in "animal"; "animate"; "animadvert," to turn the mind to, to consider; "animosity," (courage-fulness), hatred; "magnanimous," noble; "pusillanimous" (child-minded), weak, cowardly; "unanimous," one-minded, agreeing.

ANN, ENN (L. *annus,* year), as in "annals"; "annual"; "anniversary"; "biennial," two-yearly; "triennial," three-yearly; "millennium," one thousand years; "superannuated," over-yeared, old beyond usefulness, as in business, etc.

ANTHROP (Gr. *anthropos,* a man), as in "anthropometric," man-measuring; "misanthropist," man-hater; "philanthropist," a lover of humanity; "anthropology," science of man.

ARCH (Gr. *arche,* beginning, chief, head, government), "arch," shrewd; "anarchy," lack of government; "archangel," a chief angel; "archbishop"; "architect," master builder, designer; "hierarch," chief priest; "monarch," one who rules alone, a king; "patriarch," a father-king.

ARD, ARS (L. *ardere, arsum,* to burn), as in "ardent," heated with zeal; "ardor," zeal; "arson," house-burning.

AST (Gr. *aster* and *astron,* a star), as in "astral," starry; "aster," a star-shaped flower; "asteroid," a small star; "asterisk," a star-shaped sign [*]; "astronomy"; "astrology"; "disaster," evil fortune, an *ill-starred* happening.

AUG, AUCT, AUT (L. *augere, auctum,* to cause, to make, to add to), as in "augment," to increase; "author," originator; "authority," power to act or make; "authorize"; "auction," an authorized public sale.

AUTO (Gr. *autos,* self), as in "autograph," one's own writing; "autocrat," one who rules as pleases himself; "autopsy," a seeing for one's self, examination of a dead body; "automatic," self-moving; "automobile," a self-moving vehicle.

BALL, BLE, BOL (Gr. *ballo,* I throw), as in "ball"; "symbol," a sign; "emblem," a picture; "parable"; "problem" (thrown-forth), a question for solution; "hyperbole"; "parabola"; "diabolical" (accusing, slandering), pertaining to the devil, the accuser; from the French *diable,* "devil," "devilish."

BI (L. *bis,* two, twice; *bini,* two-by-two), as in "biennial," two-yearly; "bigamy," having two wives; "binary" double; "biped," two-footed animal; "combine," to join together; through the French, "biscuit" (twice-cooked). *Bi* occurs as a prefix to numerous other words, always with the meanings, *two* or *twice,* as in "binomial," "bicycle," a two-wheel.

BIBL (Gr. *biblos,* a book), as in "Bible"; "bibliography," knowledge of books; "bibliophile," a book-lover.

BIO (Gr. *bios,* life), as in "biology," "biography," "amphibious," living in both (land and water).

BREV (L. *brevis,* short), as in "brevity"; "breviary," a shortened book, a prayer book; "abbreviate," to shorten; through the French, "brief"; "abridge."

CAD, CID, CAS (L. *cadere, casum,* to fall; with prefixes CIDERE), as in "cadence"; "decadent"; "accident"; "coincide"; "incident"; "occasion"; "occident," the west, place of sunset; through the French, "case"; "casual"; "decay."

CANT, CENT, CHANT (L. *canere, cantum,* and *cantare, cantatum,* to sing, to chant; with some prefixes, *cenere* and *centare*), as in "cant," whining talk; "accent"; "canticle" and "canto," terms used in poetry; "descant" (*discanere*), to sing or relate with details; "recant," to sing again (in religion), hence to renounce heresy; "incantation," a magical song; through the French "chant," "enchant," to charm; also, "recant."

CAP, CAPT, CEPT (L. *capere, captum,* to

take), as "capacity," ability to take; "captive, captor, capture"; "accept"; "anticipate"; "emancipate"; "capable"; "recipe"; "recipient." Through the French, "conceit"; "conceive"; "deceive"; "occupy"; "receive" and "receipt." From Latin derivative, *princeps* (taken first), a leader, "prince"; "principal"; "principle."

CAP, CIP (L. *caput, capitis,* head), as in "cap," head-covering; "capitulate," to give heads of a subject; "decapitate," to cut off the head; "precipice," a headlong steep; "precipitate." Through the French, "captain," a head man, chief; "chapter," principal division of a book or society.

CEAL (L. *celere,* to hide), as in "conceal," which is derived through the French.

CEDE, CEED, CESS (L. *cedere, cessum,* to go, to yield, to cease), as in "cede"; "accede," "access," and "accession"; "precede"; "proceed," "process," and "procession"; "exceed," "excess"; "recede," "secede"; "incessant," unceasing, not going away; "succeed," to follow, to prosper (*i.e.* to follow good fortune).

CEL (L. *celsus,* high), as in "excel," to surpass; "excellent"; "excelsior," higher still.

CENT (L. *centum,* a hundred), as in "cent," a coin; "century"; "centurion," commander of 100 men; "centennial," 100-year; "centipede," hundred-foot.

CENTR (Gr. *kentron;* L. *centrum,* centre), as in "centre"; "central"; "concentrate"; "eccentric"; "paracentric"; "centrifugal," fleeing from the centre; "centripetal," centre-seeking; "concentric"; "geocentric," and "heliocentric."

CHRON (Gr. *chronos,* time), as in "chronic"; "chronicle," an historic record; "chronometer," a clock; "chronology," science of dates, etc.; "anachronism," a custom opposed to the times.

CIDE, CIS (L. *cædere, cæsum,* to cut, to kill; with prefixes, *cidere, cisum*), as in "decide"; "excise"; "excision"; "homicide, parricide, fratricide, regicide"; "incision"; "precision"; meaning "cutting" or "killing," according to the other elements in the word.

CIT (L. *citare,* to summon, to stir up), as in "cite"; "excite"; "recite"; "resuscitate" (re-sub-citatum).

CLAM, CLAIM (L. *clamare, clamatum,* to shout, to cry), as in "clamor"; "acclamation"; "exclamation." Through the French: "acclaim"; "proclaim"; "exclaim"; "reclaim."

CLAR (L. *clarus,* clear), as in "declare"; "clarify." Through the French: "clarion"; "clear" (*clair*).

CLIN (L. *clinere,* to lie, to lean), as in "clinic"; "incline"; "recline." Through the French: "declension" (L. *declinatio*).

CLUD, CLUS, CLOS (L. *claudere, clausum,* to close, to shut; with prefixes, *cludere, clusum*), as in "conclude"; "exclude"; "conclusion"; "exclusion"; "preclude"; "seclude"; "clause." Through the French: "close"; "enclose" and "enclosure"; "closet"; "disclose" and "disclosure."

COM (Gr. *komos,* a revel, a social gathering), as in "comedy"; "comic"; "encomium," a eulogy given at a feast. From the Latin, *comes, comitis,* a companion: "comity"; "concomitant," accompanying. Through the French: "count," a nobleman (*comte*), and "county."

COR, COUR (L. *cors, cordis,* heart), as in "cordial"; "concord"; "discord"; "record." Through the French: "core"; "courage"; "discourage."

CRACY, CRAT (Gr. *kratos,* power, dominion), as in "aristocracy," rule of the best; "aristocrat"; "democracy," rule of the people; "autocracy"; "autocrat"; "theocracy."

CREA (L. *creare, creatum,* to create), as in "create"; "creation"; "creature"; "recreation." Through the French: "recreant," cowardly, false.

CRED, CREED (L. *credere, creditum,* to trust, to believe), as in "creed"; "credit"; "discredit"; "credible"; "creditor," one who trusts—hence one to whom money is due.

CREE, CRIM, CERT (L. *cernere, cretum,* and *-criminare, -criminatum,* to separate, to distinguish), as in "crime," something that separates a person from others; "discriminate"; "incriminate"; "concern"; "discern"; "discreet"; "secrete"; "secret"; "secretary." Through the French: "decree" and "decretal."

CRESE, CREASE, CRETE (L. *crescere, cretum,* to grow, to increase), as in "concrete"; "discreet"; "crescent"; "excrescence." Through the French: "accrue"; "increase"; "decrease"; "recruit."

CRIS, CRIT (Gr. *krisis,* judgment; *krites,* a judge), as in "critic"; "criticism"; "criterion," a standard of judgment; "crisis," a deciding point; "hypocrite"; "hypercritical"; "hypocrisy."

CUB, CUMB (L. *cubere, cubitum,* to bend, to lie; with some prefixes, *cumbere*), as in "incumbent"; "recumbent"; "succumb"; "cubit" (L. *cubitum,* the elbow), a measure on the forearm. Through the French: "encumber."

CULT, COL (L. *colere, cultum,* to till, inhabit, care for, worship), as in "cult," a

system of worship, etc.; "colony," a new settlement, sometimes a peculiar community; "culture," "agriculture," "floriculture," etc.

CUR (L. *cura,* care), as in "cure," to care for, hence to heal; "curate"; "accurate"; "procure"; "secure"; "sinecure." Through the French: "curious." Contracted, "proxy," for "procuracy."

CURR, CURS (L. *currere, cursum,* to run), as in "concur"; "current"; "excursion"; "incur." Through the French: "carry"; "career"; "concourse"; "course"; "courier"; "discourse."

CYCL (Gr. *kuklos,* a circle), as in "cycle," a period of time, later, a wheel, as in "bicycle," "tricycle"; "encyclical," a letter sent around; "cyclopædia" and "encyclopædia" (education-circle), a compendium of information.

DAT, DIT (L. *dare, datum,* to give; with some prefixes, *-dere, -ditum*), as in "date," a given time; "mandate" (L. *mandare*), "command"; "edit"; "addition"; "perdition"; "add" (L. *addere*). Through the French: "subdue."

DEC (L. *decem;* Gr. *deka,* ten), as in "decalogue," the ten commandments; "decagon," ten-angled figure; "decimal"; "decimate," to take (kill) every tenth; "December." Through the French: "decade," a period of ten years; "dean" (L. *decanus*), a ruler of ten, now used for eldest or head in certain connections.

DEM (Gr. *demos,* people), as in "democrat"; "demagogue"; "epidemic"; "endemic."

DENT (L. *dens, dentis,* a tooth), as in "indent"; "dental"; "trident" (three-tooth); "dent," a mark as of a tooth.

DI, DIS (Gr. *dis,* two), as in "dilemma"; "diploma" (folded-double), an authoritative document; "diphthong"; "distich," a two-line stanza; "dissever," to cut in two.

DICAT (L. *dicare, dicatum,* to show, to point out), as in "abdicate"; "dedicate"; "predicate"; "index," a pointer, an indicator. Through the French: "predicament."

DICT (L. *dicere, dictum,* to say, to speak), as in "addict"; "dictate"; "diction"; "dictionary"; "interdict"; "jurisdiction"; "contradict"; "predict"; "edict"; "verdict" (*vere,* truly; *dictum,* said); "benediction." Through the French: "indict" and "indite."

DOC, DOCT (L. *docere, doctum,* to teach), as in "doctor," a teacher, learned man, a physician; "doctrine"; "document"; "docile"; "docility"; "indoctrinate." (Gr. *dokeo,* I teach), as in "dogma," a doctrine; "orthodox," rightly taught; "heterodox," otherwise taught; "paradox," a truth apparently absurd; "doxology" (Gr. *doxa,* a teaching, also glory), an expression of glory to God.

DUC, DUCT (L. *ducere, ductum,* to lead), as in "conduce"; "conduct"; "educate"; "educe"; "induce"; "introduce"; "produce"; "reduce"; "product"; "production"; "reduction"; "ductile"; "duct," a pipe for water, etc.; "aqueduct"; "viaduct"; "duke" (L. *dux,* a leader); "ducal"; "ducat," duke's money. Through the French: "conduit."

EC, OC (Gr. *oikos,* a house), as in "economical" (house-ruling), thrifty; "economics," the science of statesmanship; "diocese," an episcopal jurisdiction.

ENS, ENT (L. *ens, entis,* present participle of *esse,* to be, in its compounds), as in such adjectives as "absent"; "present"; "potent"; and such nouns as "essence."

EST (L. *est,* he is), as in "interest."

IT (L. *ire, itum,* to go), as in "ambition" (literally, a going-about for one's interests); "circuit"; "transit"; "transitive"; "transient"; "sedition"; "perish" (L. *perire*); "obituary" (from L. *obire*).

FAC, FEC, FIC (L. *facere, factum,* to do, to make; with prefixes *-ficere, -fectum*), as in "fact"; "affect"; "effect," and numerous other verbs and nouns with prefixes; "deficient"; "deficit"; "manufacture"; "munificent"; "petrifaction"; "proficient"; "sufficient"; and numerous verbs formed from *fieri, factus,* the passive form of *facere,* and verbs ending in *fy.* The word, "preface," is from *fari, fatum,* to speak, and is corrupted from the Latin *prefatum.* Also, the word, "fiction," is from the verb, *fingere, fictum,* to arrange, to put together; and "fix," as in "crucifix"; "prefix"; "transfix"; "fixture," etc., from the verb, *figere, fixum,* to fix, to secure.

FER, FERE (L. *ferre;* Gr. *phero,* to bear, to carry), as in "fertile"; "confer"; "defer"; "differ"; "infer"; "offer"; "prefer"; "refer"; "suffer"; "transfer." Many nouns ending in *fer:* "crucifer"; "conifer," etc.; also, "circumference"; "vociferous." Through the French: "proffer."

FULG (L. *fulgere,* to shine), as in "refulgent"; "effulgent."

FUND, FUS (L. *fundere, fusum,* to pour, to melt), as in "refund"; "confuse"; "diffuse"; "infuse"; "refuse"; "profuse." Through the French: "found," to melt metals; "confound," to pour together, to mix up, to perplex. (L. *fundus,* bottom, foundation), as in "fundamental"; "profundity." Through the French: "found," to establish; "foundation."

GAM (Gr. *gamos,* marriage), as in "bigamy"; "monogamy"; "polygamy"; "cryptogamous."

GE (Gr. *ge,* the earth), as in "geology," science of rocks and earth formations; "geography"; "geometry"; "apogee," greatest height above the earth.

GEN (Gr. *genea,* birth), as "genealogy," family line; "genesis," beginning; "heterogeneous," of various origins; "homogeneous," of like origin. Also many chemical terms: "oxygen"; "hydrogen"; "cyanogen," etc.

GENER, GEND, GENT (L. *genus, generis,* race, family), as in "generate"; "degenerate"; "regenerate"; "generous" (L. *generosus,* of high birth), noble, munificent; "general." Among other derivatives from Latin: "gender"; "genial"; "genius"; "genteel"; "gentile"; "gentle"; "genuine"; "ingenuity"; "progenitor."

GER, GEST (L. *gerere, gestum,* to bear, to wield, to carry on), as in "congest"; "digest"; "suggest"; "gesture"; "belligerent," waging war; "vicegerent," a substitute.

GNO (Gr. *gignosko,* I know), as in "gnostic," one of a sect who claim to know divine things; "agnostic" (not-knowing), one who disclaims knowledge of a subject; "prognostic," knowing beforehand; "gnomon," a pointer, indicator.

GRAD, GRESS (L. *gradior, gressum,* to step. to walk; with prefixes, *-gredior*), as in "grade"; "degrade"; "retrograde"; "gradual"; "graduate"; "congress"; "digress"; "ingress"; "progress"; "transgress"; "ingredient." Through the French: "degree."

GRAM, GRATH (Gr. *grapho,* I write), as in "anagram"; "epigram"; "diagram"; "telegram"; "grammar"; "geography"; "paragraph"; "lithograph"; "autograph"; "graphic."

HAB, HIB, AB (L. *habere, habitum,* to hold, to have; with prefixes, *hibere, hibitum*), as in "habit"; "habitation"; "exhibit"; "prohibit"; "habiliment." Through the French: "able" (L. *habilis*); "disable"; "enable."

HER, HES (L. *hærere, hæsum,* to stick), as in "adhere"; "cohere"; "inhere"; "adhesive"; "cohesive"; "hesitate" (L. *hæsitare*).

HETERO (Gr. *heteros,* other), as in "heterodoxy"; "heterogeneous."

HOL (Gr. *holos,* whole), as in "catholic," universal, general; "holophane"; "holocaust," whole burnt sacrifice; "holograph."

HYD (Gr. *hudor,* water), as in "hydrant"; "hydraulics"; "hydrogen"; "hydrophobia," fear of water; "dropsy" (formerly "hydropsy").

JEC (L. *jacere, jactum,* to throw; with some prefixes, *jicere, jectum*), "eject"; "inject"; "object"; "project"; "reject"; "subject"; "traject"; "abject"; "adjective"; "dejection"; "conjecture"; "ejaculate" (L. *jaculare*).

JUNC (L. *jungere, junctum,* to join), as in "juncture"; "subjunctive"; "junction"; "injunction"; "conjunction." Through the French: "join," with prefixes, *ad, con, dis, en, sub.*

LAB (Gr. root of *lambano,* I take), "syllable"; "astrolabe."

LATE (L. *latum,* from *ferre,* to bear, to carry), "dilatory"; "legislate"; "superlative"; "late," with prefixes *col, e, re, trans;* "prelate"; "oblation."

LEC, LIG (L. *legere, lectum,* to read, to gather; with prefixes *-ligere*), as in "collect"; "elect"; "select"; "intellect"; "dialect"; "elegant"; "lecture"; "legend"; "legible"; "neglect"; "lexicon"; "college"; "allegiance." Through the French: "colleague."

LEG (L. *lex, legis,* law), as in "legal"; "legislate"; "legitimate"; "privilege," a private law. (L. *legare, legatum,* to depute, to bequeathe), as in "legate"; "delegate"; "legacy." Through the French: "allege."

LIB (L. *liber,* free; *liber,* a book; *libra,* scales), as in "liberty"; "liberal"; "liberate"; "liber," a volume; "libel" (L. *libellus,* a little book); "library"; "equilibrium"; "equilibrate"; "librate," to tremble, as in balancing. "Celebrate" comes from the Latin *celeber,* and is probably not connected to any of the above words.

LIC (L. *licet,* it is allowed, it is lawful), as in "license"; "licentious"; "licentiate"; "illicit." (L. *licire, licitum,* to draw, to lure), as in "elicit," to draw out.

LIG (L. *ligare, ligatum,* to bind, to tie), "oblige"; "obligate"; "ligament"; "ligature"; "religion" (a binding-back). Through the French: "liege"; "league"; "colleague"; "liable. (L. *lignum,* wood), as in "lignite"; "ligneous."

LIM (L. *limen, liminis,* a threshold), as in "eliminate"; "preliminary"; "subliminal." (L. *limes, limitis,* a path, a limit), "limit"; "limitation"; "illimitable."

LIN (L. *linea,* a line), as in "line"; "lineal"; "linear"; "lineament"; "lineage"; "delineate." (Latin *linere,* to smear), "liniment."

LING, LANG (L. *lingua,* tongue), as in "linguist"; "lingual." Through the French: "language."

LINQ, LICT (L. *linquere, lictum,* to leave, to desert), as in "relinquish"; "delinquent";

"relict"; "derelict." Through the French: "relic."

LIQ (L. *liquere,* to melt), as in "liquid"; "liquor."

LIT (L. *litera,* a letter), as in "literal"; "literary"; "literature"; "obliterate." Through the French: "letter."

LOC, LOQ (L. *locus,* place), as in "locate"; "local"; "collocate"; "locomotive"; "dislocate." (L. *loqui, locutus,* to speak), as in "loquacious"; "colloquy"; "eloquent"; "obloquy"; "soliloquy"; "elocution"; "circumlocution."

LOG (Gr. *logos,* word, description), as in various words ending in *logy* and *ology,* as already noted: also in "logic"; "apologue"; "epilogue"; "prologue"; "eulogium"; "eulogize"; "homologous"; "syllogism."

LUD, LUS (L. *ludere, lusum,* to play), as in "allude"; "delude"; "elude"; "prelude"; "collusion"; "delusive"; "illusion"; "ludicrous."

LYSIS, LYTIC (Gr. *lusis,* loosing, breaking-up), as in "analysis"; "electrolysis"; "paralysis"; "paralytic"; "electrolytic"; "electrolyte."

MAG (L. *magnus,* great; *magister,* master), as in "magnify"; "magnitude"; "magnanimous"; "magnificent"; "magistrate." Through the French: "master" (*maistre*). (L. *magus,* an enchanter), "magic"; "magician"; "*Magi.*" (L. *Magnesia,* a place in Asia Minor), "magnet"; "magnetic"; "magnesium."

MAJ (L. *major,* greater), as in "major"; "majority"; "majestic"; "majesty."

MAN (L. *manus,* hand), as in "manual"; "manumit"; "manuscript"; "manage"; "manipulate"; "manacle." Through the French: "maintain"; "manœuvre"; "manteau." (L. *manare, manatum,* to manifest), as in "manifest" (L. *manifestus*); "emanate."

MANCY (Gr. *manteia,* soothsaying), as in "necromancy"; "chiromancy."

MAND (L. *mandare, mandatum,* to order, to command), as in "command"; "demand"; "countermand"; "remand." Also "commend" (L. *commendere,* intensive of *commandere*), to praise.

MANIA (Gr. *mania,* madness), "mania"; "maniac"; "dipsomania"; "kleptomania"; "pyromania," desire to destroy by fire.

MENS (L. *mensura,* a measure), as in "mensuration"; "immense"; "dimension"; "commensurate." The word, "commence," is from the Latin *cum* and *initium,* to make a beginning with, and is derived through the French.

MET (Gr. *metron,* measure), as in "barometer"; "chronometer"; "geometry"; "symmetry"; "diameter"; "perimeter," etc.; also "metre"; "mete"; "metric."

MIC (Gr. *micros,* small), as in "microscope"; "micrometer"; "micrograph."

MIN (L. *minere,* to hang), "imminent"; "eminent"; "prominent." (L. *minuere, minutum,* to lessen, to reduce), as in "diminish"; "minute"; "minuend." (L. *minor, minus,* less), as in "minor"; "minus"; "minority." (L. *minimum,* least), "minimum"; "minimal." The word, "miniature," commonly used as a synonym for small, comes from the Latin *minium,* red lead, formerly used in ornamenting manuscripts.

MIR (L. *mirus,* wonderful), as in "admire"; "mirror"; "miracle."

MIS, MIX (L. *miscere, mixtum,* to mingle), as in "miscellany"; "promiscuous"; "mix"; intermix"; "mixture." The words, "mingle" and "commingle," are of Anglo-Saxon origin. (L. *miser,* miserable), as in "miser"; "miserable"; "commiserate"; "misery."

MIT, MIS (L. *mittere, misum,* to send), as in "admit"; "commit"; "emit"; "permit"; "omit"; "remit"; "intermit"; "mission"; "commission"; "remission"; "admission"; "promise."

MON (L. *monere, monitum,* to advise, to warn), as in "monitor"; "summon"; "admonish"; "premonitory"; "premonition"; "monument," something that puts in mind of. (L. *mons, montis,* a mountain), as in "promontory." Through the French: "dismount"; "surmount"; "mountain"; "mound." (Gr. *monas,* alone), as in "monad"; "monotonous"; "monody"; "monarch"; "monopolize"; "monastery"; "monk" (Gr. *monachos*).

MORPH (Gr. *morphe,* form), as in "morphology"; "amorphous"; "metamorphose."

MOT, MOB (L. *movere, motum,* to move; *mobilis,* moving), as in "motion"; "commotion"; "motive"; "emotion"; "mobile"; "promote"; "remote"; "remove"; "move."

MULT (L. *multus,* many), as in "multiply"; "multiple"; "multitude"; "multiplex."

NOM (Gr. *nomas,* law), as in "astronomy"; "economy."

OD (Gr. *odos,* a road, a way), as in "episode"; "method"; "synod"; "period"; "anode"; "cathode." (Gr. *ode,* a song), as in "ode," a kind of poem; "prosody." (L. *odor,* a smell), "odor"; "odoriferous"; "malodorous."

ON (Gr. *onoma,* a name), as in "anonymous"; "synonym"; "patronymic."

ORTH (Gr. *orthos,* straight, right), "orthodoxy"; "orthoepy"; "orthopedic," child-straightening; "orthography."

OR (L. *orare, oratum,* to ask, to beg, to pray, to worship), as in "adore"; "orison"; "orator"; "inexorable." (L. *os, oris,* mouth), as in "oral"; "orifice."

OX (Gr. *oxus,* sharp, violent, sour), as in "oxygen"; "oxide"; "paroxysm."

PAN (Gr. *pan, pantos,* all), as in "panoply"; "panacea"; "pantheist"; "panorama"; "pan-American." (L. *pandere, pansum,* to spread), as in "expanse"; "expand." (L. *panis,* bread), as in "pantry"; "companion," one who eats bread with; "company"; "accompany." (L. *panellus,* cloth), as in "panel"; "impanel."

PAR (L. *par,* equal, like), as in "compare"; "disparage"; "par," even. Through the French: "peer"; "peerage"; "peerless"; "pair." (L. *parere, paritum,* to appear), as in "apparent"; "transparent." Through the French: "appear"; "disappear." (L. *pario, partum,* to bring forth, give birth to), as in "parent"; "oviparous"; "viviparous." (L. *parare, paratum,* to make ready), as in "prepare"; "separate"; "apparatus"; "apparel"; "imperative"; "imperial"; "imperious." Through the French: "repair"; "sever"; "several"; "emperor" (L. *imperator*); "sever" (L. *separare*). (L. *pars, partis,* a part), as in "part"; "apart"; "participate"; "particle"; "depart"; "impart"; "participle" (L. *particeps,* a part-taker); "particular"; "portion"; "repartee."

PATH (Gr. *pathos,* feeling, pain), as in "pathos"; "pathetic"; "antipathy"; "sympathy"; "apathy"; "pathology" (disease-science); "homeopathy"; "allopathy."

PED (L. *pes, pedis,* a foot), as in "biped"; "expedient"; "expedite"; "impede"; "quadruped"; "pedestal"; "pedestrian." Through the French: "pedigree." (Gr. *pais, paidos,* a child), as in "pediatrics," child-healing; "orthopedic"; "pedant," a schoolmaster; "pedagogue"; "pedobaptist."

PEL, PULS (L. *pellere, pulsum,* to drive), as in "expel"; "expulsion"; "compel"; "compulsion"; "dispel"; "impel"; "impulse"; "repel"; "repulse"; "pulse"; "pulsation." (L. *pellare, pellatum,* to call by name), "appellation." Through the French: "appeal."

PEND, PENS (L. *pendere, pensum,* to hang), as in "append"; "appendix"; "depend"; "impend"; "suspend"; "suspense"; "perpendicular"; "pendulum"; "propensity." (L. *pendere, pensum,* to weigh), as in "compend"; "compensate"; "dispense"; "expend"; "expense"; "recompense"; "pensive," weighing, whence thoughtful.

PET (L. *petere, petitum,* to seek), as in "appetite"; "compete"; "competent"; "petition." (L. *petare, petatum,* to fall upon), as in "impetus"; "impetuous."

PHAN, PHEN (Gr. *phaino,* I appear, I show), as in "phantom"; "phantasm"; "epiphany"; "phenomenon"; "theophany"; "phase," aspect (*phao,* I shine).

PHAS (Gr. *phasis,* a saying), as in "emphasis"; "prophesy"; "emphatic."

PHOR (Gr. *phero,* I bear), as in "metaphor"; "phosphorus," light-bearer; "periphery."

PLE, PLI (L. *plere, pletum,* to fill), as in "complete"; "complement"; "implement"; "replete."

PLIC, PLEX (L. *plicare, plicatum,* to fold), as in "complex"; "triplex"; "duplex"; "quadruplex"; "simplex"; "application"; "supplication"; "perplex"; "explicit"; "applicable." Through the French: "apply"; "supply"; "imply." (Gr. *plectos,* struck), as in "apoplexy."

POD (Gr. *pous, podos,* foot), as in "tripod"; "gasterpod"; "antipodes."

POLY (Gr. *polus,* many), "polygon"; "monopoly"; "polygamy"; "polytheism"; "polypus," many-footed.

PON, POS (L. *ponere, positum,* to place), as in "component"; "compose"; "depose"; "deposit"; "oppose"; "opponent"; "propose"; "suppose"; "transpose"; "deponent." Through the French: "expound."

PORT (L. *portare, portatum,* to carry), "comport"; "import"; "export"; "report"; "transport." (L. *portus,* a door), as in "port"; "portal." Whence, we have "porter," a carrier; also, a doorkeeper.

POSS, POT (L. *posse,* to have power, to be able), as in "possible"; "possess"; "posse"; "potent."

PRAC, PRAG (Gr. *practos* and *pragma,* deed), as in "practice"; "practicable"; "pragmatic."

PROB (L. *probare, probatum,* to prove, to try), as in "probate"; "probe"; "reprobate"; "approve"; "disprove"; "improve"; "reprove."

QUER, QUIRE, QUIS (L. *quærere, quæsitum,* to seek), as in "inquire"; "require"; "conquer"; "inquest"; "query"; "inquisitive"; "question"; "request"; "requisite." (L. *queror,* I complain), "quarrel"; "querulous." The word, "sequester," is probably derived from *sequi,* to follow, but its etymology is uncertain.

REG, REC (L. *regere, rectum,* to right, to rule), as in "correct"; "erect"; "direct"; "rector"; "regent"; "regimen"; "regiment"; "regular"; "regulate"; "rectify"; "rectitude." (L. *rex, regis,* king), as in "regal"; "regalia."

RH, RHY, RHEU (Gr. *rheo* and *rhuo,* I flow), "catarrh"; "hemorrhage," flow of blood; "diarrhœa"; "rheum"; "rhyme"; "rhythm."

ROG (L. *rogare, rogatum,* to ask, to seek), as in "rogation"; "abrogate"; "arrogant"; "derogate"; "interrogate"; "prerogative."

RUP (L. *rumpere, ruptum,* to break, to burst), as in "eruption"; "corrupt"; "disrupt"; "interrupt"; "rupture."

SCOP (Gr. *skopeo,* I see), as in "episcopal," pertaining to a bishop or "overseer" (Gr. *episkopos*); "scope"; "telescope"; "gyroscope."

SCRIB, SCRIPT (L. *scribere, scriptum,* to write), as in "scribe"; "scripture"; "script"; "ascribe"; "describe"; "prescribe"; "proscribe"; "transcribe"; "postscript"; "manuscript"; "conscript."

SED, SID, SESS (L. *sedere, sessum,* to sit), as in "assess"; "consider"; "preside"; "reside"; "subside"; "supersede"; "session"; "sediment"; "sedentary"; "president."

SERV (L. *servire, servitum,* to serve, to obey), as in "servile"; "serve"; "servitude"; "subserve." Accordant to meaning, also, "servant," which in form belongs to the next root. (L. *servare, servatum,* to keep, to preserve), as in "conserve"; "preserve"; "reserve"; "observe." Through the French: "reservoir."

SIST (L. *sistare, sistatum,* to stand, to stop; from *stare, statum*), as in "resist"; "persist"; "insist"; "consist"; "desist"; "exist."

SOLV, SOLUT (L. *solvere, solutum,* to loose), as in "absolve"; "absolute"; "dissolve"; "dissolute"; "resolve"; "resolute"; "solve"; "solution"; "solvent"; "absolution."

SOPH (Gr. *sophos,* wise), as in "sophist"; "philosophy"; "sophism"; "theosophy."

SPEC, SPIC (L. *specere, spectum,* to look at), as in "aspect"; "circumspect"; "inspect"; "retrospect"; "suspect"; "inspection"; "suspicion"; "perspective"; "spectacular"; "spectacle"; "specious"; "species"; "speculate"; "spectator."

SPIR (L. *spirare, spiratum,* to breathe), as in "spirit"; "aspire"; "inspire"; "expire"; "suspire"; "respire"; "perspire"; "conspire"; "spiritual"; "spiritous."

STA, STI (L. *stare, statum,* to stand), as in "state"; "station"; "statue"; "statute"; "standard"; "static"; "circumstance"; "constitute"; "substitute"; "instant"; "substance." (Gr. *sta,* root of verb to stand), as in "apostasy"; "ecstasy," a standing out of one's self; "system"; "hydrostatic."

STOL, STL (Gr. *stello,* I send), as in "apostle"; "epistle"; "diastole"; "systole."

SUM (L. *sumere, sumptum,* to take, to assume), as in "assume"; "consume"; "presume"; "resume"; "sumptuary"; "sumptuous." (L. *summus,* highest), as in "sum"; "summit"; "consummate"; "summary."

TAC, TEG, TEC (L. *tangere, tactum,* to touch, to attain), as in "contact"; "tact"; "integer"; "integrity." Also, "tangible"; "contingent"; "contagion." (L. *tegere, tectum,* to cover), as in "detect"; "protect"; "integument." (Gr. *tektos,* a builder), as in "architect." (Gr. *techne,* science, art), as in "technical"; "polytechnic"; "pyrotechnic."

TEL (Gr. *tele,* afar), as in "telegraph"; "telescope"; "telephone."

TEND, TENS (L. *tendere, tensum,* to reach, to stretch), as in "attend"; "contend"; "extend"; "intend"; "portend"; "pretend"; "intense"; "intent"; "tense"; "tension"; "tent." (L. *tenere, tentum,* to hold), as in "tenacious"; "tenet"; "tenement"; "tenure"; "pertinent"; "content"; "abstain"; "contain"; "appertain"; "pertain"; "retain"; "detain"; "obtain"; "sustain." (L. *tentare, tentatum,* to try), as in "tentative"; "attempt"; "tempt." (L. *tenuis,* thin), as in "tenuity"; "attenuate"; "extenuate."

THEM, THES, THET (Gr. *them* and *thes,* roots of verb, to place, to set), as in "anathema"; "theme"; "thesis"; "antithesis"; "parenthesis"; "hypothesis"; "synthesis"; "epithet"; "synthetic."

TOM (Gr. *tomos,* a cut), as in "anatomy"; "atom," what can not be cut; "epitome."

TON (Gr. *tonos,* a sound), as in "intone"; "tone"; "monotony"; "syntonic"; "tune"; "tonic," something to "tune" the body, as if a musical instrument.

TORT (L. *torquere, tortum,* to twist), as in "contort"; "distort"; "retort"; "tortuous"; "torture."

TRAH, TRAC (L. *trahere, tractum,* to draw), as in "tract"; "traction"; "attract"; "subtract"; "extract"; "protract"; "retract"; "distract." Through the French: "trait"; "treat."

VAL (L. *valere,* to be strong, to be well), as in "avail"; "invalid"; "prevail"; "valid"; "valor"; "value"; "valedictory"; "equivalent." (L. *vallum,* a valley), as in "interval."

VEN (L. *venire, ventum,* to come), as in "advent"; "prevent"; "convent"; "event"; "invent"; "intervene"; "vent." (L. *venter,* the belly), as in "ventriloquist." (L. *ventus,* wind), as in "ventilate." (L. *venenum,* poison), as in "venom."

VER, VERS (L. *vertere, versum,* to turn), as in "advert"; "avert"; "adversity"; "advertise"; "revert"; "pervert"; "verse"; "uni-

verse"; "versatile"; "diverse"; "converse"; "reverse." (L. *verus*, true), as in "aver"; "verity"; "verify"; "veracity"; "verisimilitude."

VI (L. *via*, a way), as in "obviate"; "deviate"; "previous"; "viaduct"; "impervious."

VID, VIS (L. *videre, visum*, to see), as in "evident"; "provident"; "provide"; "visit"; "vision"; "advise"; "supervise"; "revise." (L. *viduare, viduatum*, to part, to deprive of), as in "divide"; "devoid"; "void"; "individual"; "device."

VOC (L. *vocare, vocatum*, to call), as in "advocate"; "convoke"; "provoke"; "revoke"; "invoke"; "evoke"; "vocal."

VOL (L. *volare, volatum*, to fly), as in "volatile." (L. *volle*, to wish; *volitis*, willingness), as in "volition"; "benevolent"; "voluntary"; "malevolent." (L. *volvere, volutum*, to roll), as in "involve"; "revolve"; "devolve"; "revolt"; "evolution"; "involution"; "revolution."

VOR (L. *vorare*, to eat), as in "voracious"; "voracity"; "carnivorous"; "devour"; "herbivor."

ZO (Gr. *zoon*, a living being, an animal), as in "zoölogy"; "zodiac," so called from the animal figures anciently representing the constellations; "zoöphyte"; "hylozoism."

LANGUAGES

THE number of languages and dialects, ancient and modern, has been computed by Adelung to be 3,064, namely: Belonging to Asia, 987; to Europe, 587; to Africa, 276; to America, 1,214. Total, 3,064. It would take more space than our limits permit to give a tabular view of all languages: the following summary contains the principal families, and the classes in which they are generally placed:

I. *Monosyllabic Class.*—Chinese, Siamese, Avanese, Japanese.

II. *Shemitic* or *Semitic Class.*—Aræmean (Chaldee-Syriac), Hebrew, Phœnician, Arabic.

III. *Indo-European* or *Indo-Germanic Class.*—Sanskrit, Celtic, Teutonic or Gothic, Pelasgic or Greco-Latin, Sclavonic, Hungarian, Tartarian or Turkish.

IV. The *Polynesian Class,* consisting of the dialects spoken in the Indian archipelago and islands of the South Seas.

V. The *African Class.*—Remains of the ancient Libyan in the north; Soosoo and Foulah (between the rivers Senegal and Gambia); Ashantee; Amaaric, spoken in parts of Abyssinia; Hottentot, in the south; Kaffir, extending from the south along the east coast as far as Delagoa Bay.

VI. *Polysynthetic Class,* extending from north to south of both continents of America, and comprising Chilian, Peruvian, Brazilian, Mexican, Western dialects of North America, Boreal dialects of North America, etc.

The contrast between the first and the last of these classes presents an apparent anomaly. The Chinese languages have existed among a polished people from very remote antiquity, and yet are as rude and simple as if they had been just devised for the use of a nation but recently emerged from barbarism; whereas the languages in common use among the wild

tribes of America are complex and difficult in their structure, and seem as if they had been invented by a people who had made great advances in civilization. It has consequently been surmised that America was at one time the residence of a civilized people, of whom the Indian tribes are the degenerated remains.

SPECIMENS OF LANGUAGES; ANCIENT AND MODERN

WITH the view of affording the unlearned reader an idea of the appearance of some of the principal languages, dead and living, we append the passages from the New Testament composing the Lord's Prayer, in Greek, Latin, Italian, Spanish, French, German, Dutch, and English—for the sake of clearness the Greek is printed in the Roman alphabet, the aspirate at the beginning of certain words being represented by the letter *h*. The reader is called on to observe the difference between the Greek and Latin words, and how evidently the Latin is the parent of the Italian, Spanish, and French, the latter, however, possessing the least resemblance in orthography and arrangement to its original. He will also have an opportunity of comparing the German with its kindred tongue, the Dutch, and both with their relation to the Anglo-Saxon or English.

GREEK

Pater hemōn ho en tois ouranois, hagiastheto to onoma sou. Eltheto he Basileia sou. Genetheto to thelema sou, hōs en ouranō, kai epi tes ges. Ton arton hemōn ton epiousion dos hemin semeron. Kai aphes hemin ta opheilemata hemōn, hōs kai hemeis aphiemen tois opheiletais hemōn. Kai me eisenengkes hemas eis peirasmon, alla rusai hemas apo tou ponerou; hoti sou estin he Basileia, kai he dunamis kai he doxa, eis tous aiōnas. Amen.

LATIN

Pater noster, qui es in cœlis, sanctificetur nomen tuum. Adveniat regnum tuum. Fiat voluntas tua, sicut in cœlo, et in terra. Panem nostrum quotidianum da nobis hodie. Et remitte nobis debita nostra, sicut et nos remittimus debitoribus nostris. Et ne nos inducas in tentationem, sed libera nos a malo. Tibi enim est regnum, et potentia, et gloria, in sempiternum. Amen.

ITALIAN

Padre nostro, che sei ne' cieli, sia santificato i' tuo nome. Il tuo regno venga. La tua volontà sia fatta in terra come in cielo. Dacci oggi il nostro pane cotidiano. E rimettici i nostri debiti, come noi ancora gli rimettiamo a' nostri debitori. E non indurci in tentazione, me liberaci dal maligno. Perciochè tuo è il regno, e la potenza, e la gloria, in sempiterno. Amen.

SPANISH

Padre nuestro, que estás en los cielos, sea sanctificado tu nombre. Véga tu reyno; sea hecha tua volontad como en el cielo, ansi tambien en la tierra. Danos oy nuestro pan quotidiano. Y sueltanos nuestras deudas, como tambien nosotros soltamos a nuestros deudores. Y no nos metas en tentacion, mas libranos de mal. Porque tuyo es el reyno, y la potécia, y la gloria, por todos los siglos. Amen.

FRENCH

Nôtre Père qui ès aux cieux, ton nom soit sanctifié. Ton regne vienne; ta volonté soit faite sur la terre, comme au ciel. Donne-nous aujourd'hui nôtre pain quotidien. Pardonne-nous nos péchés, comme aussi nous pardonnons à ceux qui nous ont offensés. Et ne nous abandonne point à la tentation, mais délivre nous du malin. Car à toi appartient le regne, la puissance, et la gloire, à jamais. Amen.

GERMAN

Unser Vater in dem Himmel, dein Name werde geheiliget. Dein Reich komme. Dein Wille geschehe auf Erden wie im Himmel. Unser tägliches Brod gieb uns heute. Und vergieb uns unsere Schulden, wie wir unsern Schuldigern vergeben. Und führe uns nicht in Versuchung, sondern erlose uns von dem Uebel. Denn dein ist das Reich, und die Kraft, und die Herrlichkeit, in Ewigkeit. Amen.

DUTCH

Onze Vader, die in de Hemelen zijt, uw naam worde geherligd. Uw Koningrijk kome. Uw wil geschiede, gelijk in den hemel, alzoo ook op de aarde. Geef ons heden ons dagelijksch brood. En vergeef ons onze schulden, Gelijk ook wij vergeven

onzen schuldenaren. En lied ons nict in verzoeking, Maar verlos ons van den boozen. Want Uw is het koningrijk, En de kracht, en de heerlijkheid, In de eeuwigheid. Amen.

ENGLISH

Our father which art in heaven, hallowed be thy name. Thy kingdom come. Thy will be done in earth, as it is in heaven. Give us this day our daily bread. And forgive us our trespasses, as we forgive them that trespass against us. And lead us not into temptation, but deliver us from evil. For thine is the kingdom, the power, and the glory, for ever and ever. Amen.

LANGUAGE DEFINED

Language, in the largest sense of the term, may be defined as the means by which thought is expressed. Thought, as is well known, may be expressed by means of mute signs, as frowns, sighs, kind looks, gestures of the body, or by inarticulate sounds, as groans, cries, sobs, laughter. The first are usually called *natural language,* and the second *inarticulate language;* and these means of expression partly belong to the lower animals. Finally, there is *articulate language,* peculiar to man alone, and consisting of a multitude of sounds, each of which represents a distinct idea. To this last mode of expression, generally known by the simple term *language,* our attention is for the present to be directed.

ORIGINAL FORMATION OF LANGUAGE

It is sufficiently clear that the vocal organs of man are constituted with a view to his expressing himself by speech. The larynx, epiglottis, pharynx, tongue, palate, and lips, are all of them framed in such a manner as to show incontestably that they were designed for producing such sounds as we employ in articulate language.

The first language of a child is that of inarticulate sounds; it cries when it is hungry, screams when it is angry, and moans when it is in pain. The strong resemblance which subsists between the words in different languages expressive of the first social ties, is worthy of observation. Thus the word mother is

Em and *am* in Hebrew and Arabic.
Madr in Persian.
Matr in Sanskrit.
Mētēr in Greek.
Mater in Latin.
Madre in Italian.
Mère in French.
Modor in Anglo-Saxon.
Moder in Swedish.
Moder in Danish.
Moeder in Dutch.
Mutter in German.
Mater in Russian.
Mathair in Celtic.

When the *primitive men,* advancing from early necessities and simple tangible ideas, found it necessary to have words to represent the abstractions of the mind, they still proceeded according to the dictates and analogies of nature.

In all languages, every term expressive of mental operations is borrowed from the material world. Some of the terms thus applied are signally appropriate.

In the present stage of language we have become so habituated to the use of terms applied metaphorically that we seldom reflect on their original import. There are many instances in which the metaphorical word remains, when its primary signification has been forgotten. For instance, the word *capricious* does not suggest the idea of a goat, although it is derived from the Latin *caper,* a goat, to denote the character of a person who bounds from subject to subject, without paying due attention to any; like a goat, which bounds from rock to rock, without settling long in any one spot.

ON LEARNING FOREIGN LANGUAGES

The work of mastering a foreign language involves a number of considerations, among which may be mentioned the acquisition of a vocabulary, the identification of the peculiar pronunciation and the committing of noun and verb paradigms. This is only half the work, however, the mere collection of the necessary raw materials. The real understanding of the language comes with the mastery of idioms, or the peculiar ways of expressing ideas, and the number of these that are alike in two languages is by far the smallest proportion of the total number in any case. Thus, nearly the most important thing that the student learns, on entering the study of a new language, is that a sentence perfectly expressing a given idea in English would possibly have a far different, if not a completely contrary, significance in the tongue he is attempting to acquire.

It is essential, therefore, that he study not only the grammar and dictionary, but also the works of the best authors of the new language, in order to familiarize himself with the proper methods of expression. This caution is particularly necessary for the English-speaking student of another language; since, as he will discover after his studies have progressed sufficiently far, the English differs from nearly every other tongue in point of idioms and expressions.

In acquiring another language, therefore, the aspiring student must literally *unlearn* his native tongue, to the extent, at least, of ceasing to think in its *forms*, when attempting to express himself in the new dialect.

In the following pages are given short and explicit résumés of French, German, and Spanish grammar and syntax, specially arranged with a view to enabling a student to lay the foundations, at least, of a knowledge of speaking, reading, and writing. The usual method of arranging the subject into lessons has been abandoned; since, as it seems, the earnest student can far more readily master a language by carefully reading the rules of construction, arranged in a logical sequence, than would be possible with the common plan of administering the same knowledge in small doses, without that same logical arrangement.

If the student will carefully study each branch of the subject, as it is developed, not attempting to burden his mind by committing rules, lists, and paradigms, until he has a good general idea of what he must master, in order to become proficient, he will find that the terrors and difficulties of the subject rapidly disappear.

Language, like religion, must be accepted mostly on authority. There is no use in trying to "reason out" many of the rules and usages of talk: they are stated as facts, and one must be content to learn and use them.

In point of pronouncing a foreign language, the English correspondents of the separate sounds have been given, wherever possible. When such sounds as the French *u*, the German modified vowels or *ch* sound, or the French guttural *n* are encountered, the matter is treated, as far as possible, by giving directions for arranging and using the vocal organs. If these rules are carefully followed, the student will find that sounds totally foreign to English will result in each case, and, provided he is sufficiently careful, he may rest assured that his pronunciation is the correct one.

FRENCH SELF-TAUGHT

IN attempting to gain a clear understanding of a foreign language, without the help of a competent teacher, the first difficulty will be found in the pronunciation of the various vowels and diphthongs—occasionally, also, of the consonants—which differ from the English. The advantage of learning pronunciations from a teacher, or from one expert in the language, is that the separate sounds may be carefully discriminated, and, if possible, imitated. One thing must be remembered, however, and this is that very many people lack the ability to imitate sounds correctly, just as very many others have no "ear for music." If, therefore, we wish to teach the pronunciation of a language, it is quite as necessary that the principles involved in the use of the vocal organs be explained, as that a student of the piano, or other instrument, be instructed in reading notes and in properly manipulating the keys.

Since it is assumed that the student is sufficiently well acquainted with the pronunciations of English words to identify and reproduce the sounds they represent, the equivalents of the French alphabet, as far as possible, will be given with corresponding sounds in our language. Where this is not possible, from the fact that a sound is not found in English, the method of making it will be explained as clearly as possible.

THE FRENCH ALPHABET AND PRONUNCIATIONS

THE FRENCH ALPHABET lacks the *w*, found in the English and Germanic languages, and hence has but twenty-five letters. The names, as adopted in recent years, are formed largely with the French *u*-sound, which will be explained later, as the English has no exact equivalent. The sound of *u* in "fur" is the nearest approach. The values are given as nearly as possible in English words.

A, a (ah).

Pronounced like *a* in the English word "father."

B, b (b*u*).

Pronounced as in English.

C, c (s*u*).

Pronounced like *s* before *e* and *i*; like *k* before *a*, *o*, *u*, unless written with cedilla—*ç*.

D, d (d*u*).

Pronounced as in English.

E, e (*u*).

e (unaccented), pronounced like *u* in "but," before *d*, *r*, *t*, *z*, like *ai* in "bait"; *è* (grave accent), like *e* in "bet"; *é* (acute accent), like *ai* in "bait." In certain consonant combinations it has the force of *a* as in "man," or as in "father."

F, f (f*u*).

Pronounced as in English.

G, g (*ju*).

Pronounced as in English, except before *e* and *i*, where it sounds like *j* in "jet." So sounded like French *j* in a word with *u*.

H, h (*uh*).

Is generally silent, pronounced as in the English words "humor," "honor."

I, i (ee).

Pronounced like *e* in "me," except in *oi* (pronounced "*wah*") and before *n*, when it has the sound of *a* in "van," "man," as *vingt* (20), *cinq* (5), etc.

J, j (zh*u*)

Pronounced like *s* in "pleasure"; has the supposed sound of *zh*, or of *zi* in "glazier."

K, k (k*u*)

Pronounced as in English.

L, l (l*u*).

Pronounced as in English.

M, m (m*u*).

Pronounced as in English.

N, n (n*u*).

Pronounced as in English.

O, o (oh).

Short *o*, pronounced like *aw* in "paw"; long *o*, *au*, and *eau*, like *o* in "open."

P, p (p*u*).

Pronounced as in English; often mute at end of words.

Q, q (k*u*).

Pronounced like *k* (*u* never sounded after *q*).

R, r (r*u*).

Pronounced like *r* in "rut"; should be sounded carefully; never silent except at the end of words—thus, *er*, like *ay* in "bay."

S, s (s*u*).

Pronounced as in English; occasionally like *z*.

T, t (t*u*).

Pronounced like the first *t* in "tent"; is silent at the end of words—thus *et*, like *ay* in "say."

U, u (*u*).

This sound does not occur in English and will be explained later.

V, v (v*u*).

Pronounced as in English.

X, x (kz*u*).

Pronounced like *gz*, or *kz*; silent at end of words.

Y, y (ee).

Pronounced like *e* in "me."

Z, z (z*u*).

Pronounced like soft *s* in "say"; is silent at the end of words, as *ez*, like *ay*.

VOWEL PRONUNCIATIONS

THE FRENCH U, which some foreigners pronounce like *u* in "fur," "but," "hut," etc., and others, like *ee* in "feet," "beet," "meet," etc., is really a compromise between these two errors. Its pronunciation is virtually the same as that of the German modified *u*, which is really a combination with the short *e* sound (like *e* in "bet"). Because this compound sound does not occur in English, the only means for identifying it, in the absence of a teacher, is to observe the proper conformation of the vocal organs, particularly the lips. Having thoroughly identified the sounds of *oo*, as in "fool," "tool," "school," and of *e*, as in "bet," "wet," sound the former until the position of the lips and teeth are fully understood. Having done this, change the sound from *oo* to short *e*, without moving the lips, and prolong it until thoroughly identified. The rule given usually is to "fix the lips to say *oo*, and say short *e*, or to say *ee*, as in feet, with the lips fixed to say *oo*," but it is necessary to practice both the component sounds carefully before attempting to combine them, as stated.

THE SOUNDS OF DIPHTHONGS AND TRIPHTHONGS in French are as peculiar as those of the vowels.

Thus, AU and EAU have the sound of *o* in the English exclamation "oh!"

On the other hand, EU and U have the sound of *u* in "but," "much," "such," etc.

AI, AY, EI, and EY sound like *a* in "late," "rate," etc.

OI, like English *wa*, as in "warrant," or as if a *w* were prefixed to the exclamation "ah!" In combining *oi* into words, the effect after consonants is as if short *u*, as in "but," "hut," etc., were sounded before it. Thus, the word, *droit*, has the sound of *dru-wah* run into a monosyllable; the *u* merging into *wa* so rapidly as to form one vowel sound. When sounded before another syllable, *oi* or *oy* give the effect of consonant *y*. Thus, *moyen* is sounded *mwah-yanh*.

The sound of *ui* and *oui* is like the English pronoun "we."

When *i* and *e* occur together they are sounded separately, the pronunciation varying as the consonant following. Thus in *mien,* the *e* has the sound of *a* in "man," while in *mienne,* that of *e* in "men."

The sound of *ou* is the same as that of *oo* in the English "moon."

CONSONANT PRONUNCIATIONS

Among consonant sounds there are several important variations from the English pronunciations. Thus, *ch* before a vowel has the sound of *sh,* but, before a consonant of *k,* as in *Chretien* (*kray-tyanh*).

GN in the midst of a word always has the sound of *ny,* as in "canyon," except in a very few words seldom used.

S final is silent, except in such words as *atlas, fils, gratis,* and in Greek and Latin names.

DRE final has the approximate sound of *dr,* omitting the *e.*

ABLE and IBLE, as suffixes, have the sound of *abl* and *ibl,* as in English, except for the fact that the vowel *a* or *i* is usually long (*a* as in "father"; *i* as *ee* in "beet"), thus thowing the *bl* still further into obscurity.

FINAL N AND ND are frequently made equivalent to *ng*—thus *prends* is represented as "prong"—but this combination hardly represents the French sound to the average student. The *e* in the above word has nearly the sound of *o* in "prong," but the final consonants form the sound of *nh,* made in the throat, and approaching the sound of *nk,* far more nearly than *ng.* Considering that the *h* has the force of suddenly terminating the sound of *n,* as if another consonant, like *d, g, k, t,* were to follow, but without giving a distinct consonant sound, we have very nearly the quality required. Since the vowel is given a guttural (or throat) quality, the consonants following will naturally be thrown as far back in the mouth as possible, thus giving the sound popularly supposed to come "through the nose."

In trying to learn this sound, the best method is to sound the vowel fully and as long as is necessary to render it perfectly definite to the mind; then to give the consonant following it, *with as few changes as possible* in the position of the tongue, palate, lips, etc. This is a mechanical rule, but it can not fail to identify the sound, and finally enable its ready production, if persistently followed in practice.

Final consonants, *d, g, r, s, t, x,* are regularly silent; *n,* as in *bon* (*bawnh*), is much abbreviated, being scarcely more than a breathing.

Since it is the rule in French to make the final *s* and *t* silent, it follows that the sound of a final *s* or *t* is thrown forward, so as to be the first sound of a succeeding word in a sentence, provided that word begin with a vowel or silent *h.* Thus: *les* (lay), "the" (PLUR.), but *les hommes* (lay zaum), "the men." Final silent *t* is similarly thrown forward in all cases except with *et,* "and." Thus: *C'est un homme* (say tunh aum); but, *Une femme et un homme* (Une famm ay unh aum).

These pronunciations for vowels and consonants are as nearly correct as it is possible to state them on paper. Learning a language is like learning singing: to obtain the correct intonation it is highly desirable, if not necessary, to have assistance from a master. It is possible, however, to learn to read and express one's self correctly, and to leave the more difficult points of pronunciation to be "learned by ear." Nearly every educated person knows French, and those who study without a master ought, when an opportunity occurs, to ask the pronunciation of a difficult word; by such means it is possible to arrive at correct pronunciation, which no description of words is fully capable of conveying.

ACCENTS

There are three accents in the French language: the acute, thus, *é;* the grave, thus, *è;* and the circumflex, *ê.* The *circumflex* accent simply denotes the elision of a silent (generally an "*s*") after it, thus *tête,* originally written *teste; dépôt* for *depost,* etc. The acute and grave accents belong exclusively to the letter "*e*"; an accented *e* must have the *acute* accent, if at the end of a word, as *café;* or followed by a pronounced syllable, as *métal;* a *grave* accent when followed by a silent syllable, as *mère, lièvre.*

The grave accent is used, however, on the *a* of the adverb *là* (*there* and its compounds *voilà,* etc.); but it is thus employed merely to distinguish it from the article *la* (*the*), and not for any effect in pronunciation. Similarly, it is used on the preposition, *à,* to distinguish it from the third person singular present of *avoir;* and on the adverb, *où,* "where," to distinguish it from the conjunction, *ou,* "or."

VOCABULARY OF COMMON AND USEFUL WORDS

OBSERVE CAREFULLY.—In order to make the pronunciation of French words as clear as possible the following equivalents will be given in this vocabulary: *u* for French *u*; *uh* for *u*, as in "but"; *oo* for *u*, as in "flute." As the *h* following a vowel or consonant is commonly supposed to have the force of a consonant, without giving a distinct sound, shortening a vowel and abruptly checking the sound of *m* and *n*, it will be used thus in the following vocabulary: Thus, the French *le*, in which the *e* has the sound of *e* in "bet," is given as *leh*. Long *a*, as in "father," is *ah*, or italicized (*a*): short *a*, as in "hat" is roman (a); so with *o*, long (*o*) and short (o).

In numerous words ending in *eille*, while the *ll* and final *e* are properly silent, the voice makes a sound resembling the syllable, *yeh*, very much abbreviated. In the following vocabulary, this is expressed by *-yh*, the *y* being sounded as a consonant. Thus: *la corneille* (lah cornay-yh). The same closure of the vocal organs ends words with final *gne*. Thus: *la campagne* (lah comh-pan-yh), *la montagne* (lah monh-tan-yh).

The definite Article is *"le"* before a masculine noun, and *"la"* before a feminine noun; they are both written *"l'"* before a noun commencing with a vowel or silent *"h."* The indefinite Article is "un" masculine, and *"une"* feminine.

THE UNIVERSE

God, *Dieu*, Deeyuh
the world, *le monde*, leh maund
the sky, *le ciel*, leh seeyel
the sun, *le soleil*, leh so-layee
the moon, *la lune*, lah lune
a star, *une étoile*, une aituh-*ahl*
the air, *l'air*, l'air
the earth, *la terre*, lah tayr
the water, *l'eau*, l'o
the fire, *le feu*, leh fuh
the sea, *la mer*, lah mare
an island, *une île*, une eel
a lake, *un lac*, unh lahc
a stream, *un fleuve*, unh fluhv
a river, *une rivière*, une reeveeair.
the animals, *les animaux*, laiz aneemo
the metals, *les métaux*, lai maito
the gold, *l'or*, l'orr
the silver, *l'argent*, l'arjanh
the iron, *le fer*, leh fayr
the steel, *l'acier*, l'asseayh
the copper, *le cuivre*, leh cweevr
the tin, *l'étain*, l'aytanh

MAN AND THE PARTS OF THE BODY

man, *l'homme*, l'omm
the body, *le corps*, leh cor
the head, *la tête*, lah tait
the face, *le visage*, leh veesaj
the forehead, *le front*, leh fronh
the eye, *l'œil*, luh-yee
the eyes, *les yeux*, laiz yuh
the nose, *le nez*, leh nay
the ears, *les oreilles*, laiz oray-yee
the chin, *le menton*, leh mantonh
the beard, *la barbe*, lah barb
the mouth, *la bouche*, lah boosh
the lips, *les lèvres*, lai layvr
the tooth, *la dent*, lah danh
the tongue, *la langue*, lah langh
the neck, *le cou*, leh coo
the shoulders, *les épaules*, laiz aipole
the arm, *le bras*, leh brah
the hand, *la main*, lah manh
the fingers, *les doigts*, lai duah
the nails, *les ongles*, laiz aungl
the chest, *la poitrinè*, lah puahtreen
the heart, *le cœur*, leh keuhr
the lungs, *les poumons*, leh poomonh
the leg, *la jambe*, lah zhahmb
the foot, *le pied*, leh peeay
the bones, *les os*, lay zoh

FOOD AND DRINK

the bread, *le pain*, leh panh
the flour, *la farine*, lah fareen
meat, *de la viande*, de lah veeandh
roast meat, *du rôti*, du rotee
beef, *du bœuf*, du buff
veal, *du veau*, du vo
mutton, *du mouton*, du mootonh
lamb, *de l'agneau*, deh l'anyo
pork, *du porc*, du pork
bacon, *du lard*, du lar
ham, *du jambon*, du zhahmbonh
the soup, *la soupe*, lah soop
rice, *du riz*, du ree
eggs, *des œufs*, daiz uhff
salad, *de la salade*, deh lah salahd
mustard, *de la moutarde*, deh lah mootard
salt, *du sel*, du sel
oil, *de l'huile*, deh l'weel
vinegar, *du vinaigre*, du veenaigr
pepper, *du poivre*, du puahvr
butter, *du beurre*, du buhr
cheese, *du fromage*, du fromahj
the breakfast, *le déjeuner*, leh dayzhuhnai
the dinner, *le diner*, leh deenai
the supper, *le souper*, leh soopai
hunger, *la faim*, la fanh
thirst, *la soif*, lah suaf

water, *de l'eau,* deh l'*o*
wine, *du vin,* du vanh
beer, *de la bière,* deh lah beeair
milk, *du lait,* du lay
tea, *du thé,* du tay
gin, *du genièvre,* du jenyavr
brandy, *de l'eau de vie,* deh l*o* deh vee

THE DRESS

a coat, *un surtout,* unh s*u*rtoo
a cloak, *un manteau,* unh m*a*nt*o*
a waistcoat, *un gilet,* unh jeelay
the trousers, *la culotte,* la k*u*lott
the braces, *les bretelles,* lai bretell
the cap, *le bonnet,* leh bonnay
the hat, *le chapeau,* leh shap*o*
the comb, *le peigne,* leh peine
gloves, *des gants,* dai g*a*nh
a ring, *une bague,* *u*ne bog
a watch, *une montre,* *u*ne monhtr
the stocking, *le bas,* leh bah
the boots, *les bottes,* lai bot
the bootjack, *le tire-botte,* leh teer bot
the slippers, *les pantoufles,* lai pauntoofl
the shoes, *les souliers,* lai soolyai
a shirt, *une chemise,* *u*ne shemeeze
a pocket handkerchief, *un mouchoir,* unh mooshouah
the cothes brush, *la brosse,* lah bross
the umbrella, *le parapluie,* leh paraplu-wee
the parasol, *le parasol,* leh parasol

HOUSE UTENSILS

a table, *une table,* *u*ne tahbl
a chair, *une chaise,* *u*ne shayse
an armchair, *un fauteuil,* unh foh-tuh-yuh
a looking-glass, *un miroir,* unh meeruahr
a clock, *une horloge,* *u*ne orloje
a trunk, *un coffre,* unh cofr
a box, *une boîte,* *u*ne buaht
the bed, *le lit,* leh lee
the counterpane, *la couverture,* lah coovair-tyure
a pillow, *un oreiller,* unh oraylyai
the sheets, *les draps de lit,* lai drah deh lee
the mattress, *le matelas,* leh matlah
the plate, *l'assiette,* l'assyet
the candlestick, *un chandelier,* unh shandelyai
the lamp, *une lampe,* *u*ne lamp
a spoon, *une cuiller,* une kw*u*-yay
a fork, *une fourchette,* *u*ne foorchett
a knife, *un couteau,* unh coot*o*
a cup, *une tasse,* *u*ne tass
a saucer, *la soucoupe,* lah soocoop
the tablecloth, *la nappe,* lah nap
the towel, *un essuie-main,* unh esswee manh
a glass, *un verre,* unh vair
the tea-pot, *la théière,* lah taiyair

RELATIONS

the family, *la famille,* lah fameel
the husband, *le mari,* leh maree
the wife, *la femme,* lah fam
the father, *le père,* leh pare
the mother, *la mère,* lah mare
the child, *l'enfant,* l'anhf*a*nh
the son, *le fils,* leh feess
the daughter, *la fille,* lah feel
the brother, *le frère,* leh frair
the sister, *la sœur,* lah suhr
the uncle, *l'oncle,* l'awnkl
the aunt, *la tante,* lah t*a*nt
the cousin, *le cousin,* leh coosanh
the marriage, *le mariage,* leh mareeahj

OCCUPATIONS

an occupation, *un métier,* maytyai
a workman, *un artisan,* arteesonh
a baker, *un boulanger,* boolanh-zhay.
a miller, *un meunier,* meuhnyai
a butcher, *un boucher,* booshai
a brewer, *un brasseur,* brassuhr
a tailor, *un tailleur,* ti-yur
a shoemaker, *un cordonnier,* cordonyai
a smith, *un forgeron,* forjehronh
a saddler, *un sellier,* say-yay
a carpenter, *un menuisier,* mennweesyai
a mason, *un maçon,* massonh
a bookbinder, *un relieur,* relleeuhr

THE TOWN

the town, *la ville,* lah veel
the bridge, *le pont,* leh p*o*nh
the tower, *la tour,* lah toor
the gate, *la porte,* lah port
the street, *la rue,* lah ru
the market, *le marché,* leh marshay
the building, *le bâtiment,* leh bahteem*a*nh
the townhouse, *l'hôtel de ville,* l'otel deh veel
the theatre, *le théâtre,* leh tayahtr
the post-office, *la poste,* lah post
the church, *l'église,* l'aygleeze
the cathedral, *la cathédrale,* lah cataydral
the school, *l'école,* laycoll
the prison, *la prison,* lah preesonh
the exchange, *la bourse,* lah boorse
the palace, *le palais,* leh pallay
the hotel, *l'hôtel,* l'otel
the inn, *l'auberge,* l'obayrj
the public house, *le cabaret,* leh cabbaray
the coffee room, *le café,* leh caffay

THE HOUSE

the house, *la maison,* lah maysonh
the door, *la porte,* lah port
the lock, *la serrure,* lah serr*u*r
the key, *la clé,* lah clay

the bell, *la sonnette,* lah sonnet
the staircase, *l'escalier,* l'escallyai
the drawing-room, *la salle,* lah sal
the dining-room, *la salle-à-manger,* lah salah-manzhai
the room, *la chambre,* lah shambr
the bedroom, *la chambre-à-coucher,* lah shambr-a-cooshay
the window, *la fenêtre,* lah fennaitr
the wall, *la paroi,* lah pahruah
the kitchen, *la cuisine,* lah cweezeen
the roof, *le toit,* leh tuah
the cellar, *la cave,* lah caav
the garden, *le jardin,* leh zhardanh

ANIMALS

an animal, *un animal,* unh aneemal
a horse, *un cheval,* unh sheval
a donkey, *un âne,* unh ahn
the dog, *le chien,* leh sheeanh
the cat, *le chat,* leh shah
the rat, *le rat,* leh rah
the mouse, *la souris,* lah sooree
an ox, *un bœuf,* unh beuh
a cow, *une vache,* une vash
a calf, *un veau,* unh vo
a sheep, *une brebis,* une brebbee
a lamb, *un agneau,* unh anyo
a pig, *un cochon,* unh coshonh
the hare, *le lièvre,* leh leeayvr
a monkey, *un singe,* unh sanj
a wolf, *un loup,* unh loo
a bear, *un ours,* unh oorse
a lion, *un lion,* unh leeonh
an elephant, *un éléphant,* unh aylayfonh
a tiger, *un tigre,* unh teegr

BIRDS

a bird, *un oiseau,* unh wahzoh
a cock, *un coq,* unh cock
a hen, *une poule,* une pool
a chicken, *un poulet,* unh poolay
a swan, *un cigne,* unh sinyh
a goose, *une oie,* une wha
a duck, *un canard,* unh canar
a lark, *une alouette,* une alwett
a nightingale, *un rossignol,* unh rosseenyol
the swallow, *l'hirondelle,* l'eeronhdel
the sparrow, *le moineau,* leh muano
the raven, *le corbeau,* leh corbo
the crow, *la corneille,* lah cornay-yh
the parrot, *le perroquet,* leh perrokay
the eagle, *l'aigle,* l'aygl

FISHES AND INSECTS

a fish, *un poisson,* unh puassonh
a pike, *un brochet,* unh broshay
a salmon, *un saumon,* unh somonh
a carp, *une carpe.* une carp
an eel, *une anguille,* une onggheel
a trout, *une truite,* une trweet
a herring, *un hareng,* unh harronh
oysters, *des huîtres,* dai zweetr
a crab, *une écrevisse,* une aycreveese
a turtle, *une tortue,* une tortyu
a whale, *une baleine,* une ballayn
a serpent, *un serpent,* unh sairponh
a frog, *une grenouille,* une granooeeyh
a worm, *un ver,* unh vair
an insect, *un insecte,* anh
a spider, *une araignée,* une arraynyai
a moth, *une teigne,* unh taine
a fly, *une mouche,* une moosh
a gnat, *un moucheron,* unh moosheronh
a bee, *une abeille,* une abbay-yh
the honey, *le miel,* leh meeyell
a wasp, *une guêpe,* une gwape
a butterfly, *un papillon,* unh pap-pee-yonh

VEGETABLES

beans, *des fèves,* dai faive
peas, *des pois,* dai puah
cabbage, *des choux,* dai shoo
cauliflower, *des choux-fleurs,* dai shoo-fluhr
carrots, *des betteraves,* dai betrahve
asparagus, *des asperges,* daiz aspairj
spinach, *des épinards,* daiz aipeenar
radishes, *des radis,* dai raddee
celery, *du céleri,* du selleh-ree
a melon, *un melon,* unh mellonh
cucumber, *des concombres,* dai konh-komhbr

TREES AND FLOWERS

a tree, *un arbre,* unh arbr
a branch, *une branche,* une brawnhsh
a leaf, *une feuille,* une fuh-eel
an apple, *une pomme,* une pomm
a pear, *une poire,* une puah
a plum, *une prune,* une prune
a cherry, *une cerise,* une serreeze
a nut, *une noix,* une nuah
a currant, *de la groseille,* de lah grozah-yh
a gooseberry, *de la groseille verte,* deh lah grozah-yh vert
a strawberry, *une fraise,* une fraize
a chestnut, *un marron,* unh marronh
the oak-tree, *le chêne,* leh shane
the fir-tree, *le pin,* leh panh
the birch, *le bouleau,* leh boolo
the willow, *le saule,* leh sole
a flower, *une fleur,* une fluhr
a rose, *une rose,* une rose
a pink, *un œillet,* unh uh-yay
a tulip, *une tulipe,* une tuleep
a lily, *un lis,* unh lee
a violet, *une violette,* une vee-oh-lett
a bouquet, *un bouquet,* unh bookay

THE SCHOOL

a school, *l'école,* l'aycol
the teacher, *le maître,* leh maytr
the book, *le livre,* leh leevr
the paper, *le papier,* leh papyai
a pen, *une plume,* une plum
an inkstand, *une encrier,* unh onh-kree-yay
the ink, *l'encre,* lonh-kr
the pencil, *le crayon,* leh crayonh
a letter, *une lettre,* une lettr
an envelope, *une enveloppe,* une onhvellope

TIME AND SEASONS

the time, *le temps,* leh tonh
a minute, *la minute,* lah meenut
an hour, *une heure,* une uhr
a quarter of an hour, *un quart d'heure,* unh kar derr
half an hour, *une demie-heure,* une demmy err
four o'clock, *quatre heures,* katr err
a quarter of four, *quatre heures moins le quart,* katr err mwanh leh kar
a quarter past four, *quatre heures et quart,* katr err ay kar
twenty minutes past eight, *huit heures vingt,* wheet err vanh
half-past six, *six heures et demie,* seece err ay demmee.
the day, *le jour,* leh zhoor
the morning, *le matin,* leh mattanh
noon, *le midi,* leh meedee
the afternoon, *l'après-midi,* l'apray meedee
the evening, *le soir,* leh suahr
the night, *la nuit,* lah nwee
a year, *un an,* un anh
a month, *un mois,* unh mouah
January, *janvier,* zhonhveeay
February, *février,* fayvreeay
March, *mars,* marse
April, *avril,* avreel
May, *mai,* may
June, *juin,* jyuanh
July, *juillet,* jweelyai
August, *août,* oo
September, *septembre,* setawmbr
October, *octobre,* octobr
November, *novembre,* no-vahmbr
December, *décembre,* daysahmbr
a week, *une semaine,* une semmane
a fortnight, *quinze jours,* kanhze zhoor
Monday, *lundi,* lundee
Tuesday, *mardi,* mardee
Wednesday, *mercredi,* mayrcredee
Thursday, *jeudi,* zhuh-dee
Friday, *vendredi,* vonhdredee
Saturady, *samedi,* samdee
Sunday, *dimanche,* deemaunshe
spring, *le printemps,* leh pranhtahnh
summer, *l'été,* l'aytay
autumn, *l'automne,* l'otonn
winter, *l'hiver,* l'eevare

THE COUNTRY

the country, *la campagne,* lah comhpan-yi
the village, *le village,* leh veelaj
the hut, *la cabane,* lah cabanne
the soil, *le sol,* leh sol
the meadow, *le pré,* leh pray
the barn, *le grange,* leh granj
the mill, *le moulin,* leh moolanh
the cattle, *le bétail,* leh baytale
the herds, *le troupeau,* leh troopo
the shepherd, *le berger,* leh bayrjay
the mountain, *la montagne,* lah monh-tan-yh
the hill, *la colline,* lah colleen
the dale, *la vallée,* lah vallay
the wood, *le bois,* leh bouah
the forest, *la forêt,* lah forray
the road, *le chemin,* leh shemmanh
the high-road, *le grand-chemin,* leh granh shemmanh
the railroad, *le chemin de fer* leh shemmanh deh fare
a mile, *un mille,* unh meel
the waterfall, *la cascade,* lah cascad
the fisherman, *le pêcheur,* leh payshuhr
the huntsman, *le chasseur,* leh shassuhr

NATIONS

an American, *un Américain,* Amayreecanh
a German, *un Allemand,* Allh-manh
Germany, *l'Allemagne* f., Lallh-manh
a Dutchman, *un Hollandais,* unh Ohlahnday
Holland, *la Hollande,* lah Ohlanhnd
a Belgian, *un Belge,* unh Belj
Belgium, *la Belgique,* lah Beljeek
a Swiss, *un Suisse,* unh Sweess
Switzerland, *la Suisse,* lah Sweess
an Hungarian, *un Hongrois,* unh Aunh-gruh-wah
Hungary, *la Hongrie,* la Aungree-yh
an Englishman, *un Anglais,* un Aunglay
England, *l'Angleterre* f., l'Aungltare
an Irishman, *un Irlandais,* un Eerlaunday
Ireland, *l'Irlande,* f., l'Eerlaund
a Scotchman, *un Ecossais,* un Aycossay
Scotland, *l'Ecosse* f., l'Aycoss
a Dane, *un Danois,* unh Danouah
Denmark, *le Danemarc,* leh Danmark
a Swede, *un Suédois,* unh Swaydwah
Sweden, *la Suède,* lah Swayde
a Russian, *un Russe,* unh Russe
Russia, *la Russie,* lah Russee
a Spaniard, *un Espagnol,* unh Espanyull
Spain, *l'Espagne* f., Lespahn-yh
a Frenchman, *un Français,* unh Fraunhsay
France, *la France,* lah Fraunhse
an Italian, *un Italien,* unh Eetalyanh
Italy, *l'Italie* f., l'Eetalee

ADJECTIVES

English	French	Pronunciation
poor	*pauvre*	pohvr
rich	*riche*	reesh
clever	*prudent*	prudonh
stupid	*stupide*	stupeed
sharp	*aigu*	aygu
blunt	*obtus*	obtu
clean	*propre*	propr
dirty	*sale*	sal
hard	*dur*	dure
soft	*mou*	moo
strong	*fort*	fore
weak	*faible*	fabbl
well	*sain*	sanh
ill	*malade*	mallad
lean	*maigre*	maygr
thick	*gros*	gruh
fat	*gras*	grah
thin	*mince*	manhce
polite	*poli*	polee
impolite	*malhonnête*	mallonnate
false	*faux*	fo
deep	*profound*	profonh
wide	*large*	larj
narrow	*étroit*	aytrouah
round	*rond*	ronh
square	*carré*	carray
short	*court*	coor
long	*long*	lang
warm	*chaud*	sho
cold	*froid*	frouah
fresh	*frais*	fray
ripe	*mûr*	mur
dry	*sec*	sec
sour	*aigre*	aygr
sweet	*doux*	doo
bitter	*amer*	amair
hungry	*affamé*	affammay
thirsty	*altéré*	altayray
heavy	*pesant*	pezonh
light	*léger*	layzhay
wet	*humide*	umeed
content	*content*	conhtonh
happy	*heureux*	uhruh
gay	*gai*	gay
sad	*triste*	treest
useful	*utile*	uteel
strange	*étrange*	aytraunj
pretty	*joli*	jolee
ugly	*laid*	lay
dark	*sombre*	sombr
open	*ouvert*	oovare
disagreeable	*désagréable*	dayzagrayabl
proud	*fier*	feeair
arrogant	*arrogant*	arrogonh
cowardly	*lâche*	lahsh
courageous	*courageux*	coorrajuh
faithless	*perfide*	pairfeed
innocent	*innocent*	innosonh

VERBS

English	French	Pronunciation
to eat	*manger*	maunjai
to drink	*boire*	buahr
to be thirsty	*avoir soif*	avuahr swahf
to be hungry	*avoir faim*	avuahr fanh
to breakfast	*déjeûner*	day-zhuhnai
to dine	*diner*	deenai
to sup	*souper*	soopai
to lay the tablecloth	*mettre le couvert*	metr leh coovair
to serve	*servir*	sareveer
to carve	*decouper*	duh-coopay
to smoke	*fumer*	fumai
to sneeze	*éternuer*	aytairnuai,
to cough	*tousser*	toossai
to think	*penser*	paunhsai
to reflect	*réfléchir*	rayflaysheer
to speak	*parler*	parlai
to say	*dire*	deer
to repeat	*répéter*	raypaytai
to explain	*déclarer*	dayclarrai
to be quiet	*se taire*	seh tare
to chat	*causer*	cosay
to tell	*raconter*	racconhtai
to ask	*demander*	demaundai
to answer	*répondre*	rayponhdr
to reply	*répliquer*	raypleekai
to be mistaken	*se tromper*	seh trompai
to object	*objecter*	objectai
to doubt	*douter*	dootai
to affrm	*affirmer*	affeermai
to prove	*prouver*	proovai
to assure	*assurer*	assurai
to deny	*nier*	neeai
to maintain	*soutenir*	soot'neer
to dispute	*disputer*	disputai
to consent	*consentir*	conhsaunteer
to approve	*approuver*	approovai
to praise	*louer*	looai
to admire	*admirer*	admeerai
to blame	*blâmer*	blahmai
to believe	*croire*	cruahr
to know	*savoir*	savuahr
not to know	*ignorer*	eenyorai
to imagine	*imaginer*	eemajeenai
to compare	*comparer*	compahrai
to imitate	*imiter*	eemeetai
to forget	*oublier*	oobleeai
to remember	*se souvenir*	seh soovenneer
to wish, to will	*vouloir*	vool-wahr
to desire	*désirer*	dayseerai
to wish	*souhaiter*	sooaytai
to love	*aimer*	aimai
to flatter	*flatter*	flattai
to embrace	*embrasser*	aumbrossai
to hope	*espérer*	espayrai
to rejoice	*se réjouir*	seh rayjooeer
to give	*donner*	donnai
to thank	*remercier*	remmairceeai

English	French	Pronunciation
to esteem	*estimer*	esteemai
to honor	*honorer*	onorai
to despise	*mépriser*	maypreezai
to hate	*haïr*	a-eer
to offend	*offenser*	offonhsai
to insult	*insulter*	anhsultay
to quarrel	*quereller*	kerrellai
to swear	*jurer*	zhuray
to punish	*punir*	puneer
to beat	*battre*	battr
to weep	*pleurer*	pluhrai
to sigh	*soupirer*	soopeerai
to regret	*regretter*	regrettai
to repent	*se repentir*	seh repaunteer
to excuse	*excuser*	excusai
to pardon	*pardonner*	pardonnai
to revenge	*venger*	vaunhjai
to joke	*railler*	rah-yay
to laugh	*rire*	reer
to live	*vivre*	veevr
to feel	*sentir*	saunteer
to touch	*toucher*	tooshai
to taste	*goûter*	gootai
to see	*voir*	vuahr
to hear	*entendre*	auntaundr
to grow	*croître*	cruahtr
to go	*aller*	allai
to go out	*sortir*	sorteer
to return	*retourner*	retoornai
to meet	*rencontre*	raunconhtrai
to follow	*suivre*	sweevr
to run	*courir*	cooreer
to jump	*sauter*	sotai
to fall	*tomber*	tombai
to dance	*danser*	daunhsai
to play	*jouer*	zhooai
to ascend	*monter*	monhtai
to descend	*descendre*	dessaundr
to sit down	*s'asseoir*	sassuahr
to lie down	*se coucher*	seh cooshai
to rest	*se reposer*	seh repozai
to sleep	*dormir*	dormeer
to dream	*rêver*	rayvai
to awake	*s'éveiller*	sayvay-yay
to get up	*se lever*	seh levvai
to dress	*s'habiller*	sab-bee-yay
to pull	*tirer*	teerai
to show	*montrer*	monhtrai
to present	*présenter*	praysauntai
to take	*prendre*	praundr
to accept	*accepter*	acceptai
to refuse	*refuser*	reffusai
to receive	*recevoir*	ressevouahr
to spoil	*gâter*	gahtai
to throw	*jeter*	zhettai
to lose	*perdre*	pairdr
to look for	*chercher*	shairshai
to find	*trouver*	troovai
to hide	*cacher*	cashai

English	French	Pronunciation
to cover	*couvrir*	coovreer
to uncover	*découvrir*	daycoovreer
to carry	*porter*	portai
to bring	*apporter*	apportai
to travel	*voyager*	vwha-yazhay
to depart	*partir*	parteer
to arrive	*arriver*	arreevai
to ring the bell	*sonner*	sonnai
to open	*ouvrir*	oovreer
to go in	*entrer*	auntrai
to buy	*acheter*	ashtai
to sell	*vendre*	vaundr
to pay	*payer*	paiyai
to lend	*prêter*	praytai
to borrow	*emprunter*	aumpruntai
to return	*rendre*	raundr
to repay	*rembourser*	raumboorsai
to exchange	*changer*	chaunh-zhai
to pack up	*empaqueter*	aumpacktai
to unpack	*dépaqueter*	daypacktai
to steal	*voler*	volai
to study	*étudier*	aytudeeai
to learn	*apprendre*	appraundr
to read	*lire*	leer
to calculate	*compter*	conhtai
to write	*écrire*	aycreer
to sign	*signer*	seenyai
to seal	*cacheter*	cashtai
to explain	*expliquer*	expleekai
to translate	*traduire*	tradweer
to begin	*commencer*	commaunsai
to continue	*continuer*	conhteenwai
to finish	*finir*	feeneer
to work	*travailler*	trav-vah-yay
to paint	*peindre*	pahndr
to draw	*dessiner*	desseenai
to stitch	*coudre*	coodr
to spin	*filer*	feelai
to wash	*laver*	lavai
to cook	*cuire*	cweer
to roast	*rôtir*	roteer
to boil	*bouillir*	booeelyeer
to weigh	*peser*	pezai
to build	*bâtir*	bahteer
to sow	*semer*	semmai
to pluck	*cueillir*	keh-yair
to plant	*planter*	plauntai
to reap	*moissonner*	mouahssonnai

CONJUNCTIONS

or	*ou*	oo
either—or	*ou—ou*	oo—oo
neither—nor	*ni—ni*	nee—nee
also	*aussi*	ohsee
but	*mais*	may
however	*cependant*	seppaundonh
yet	*pourtant*	poortanh
if	*si*	see
if not	*si non*	see nonh

English	French	Pronunciation
if only	*pourvu que*	poorvu keh
even if	*quand même*	kaunh meym
although	*quoique*	cooahk
that is to say	*c'est-à-dire*	sait-ah-deer
as	*comme*	kum
except that	*outre que*	ootr kuh
for	*car*	car
because	*parceque*	parsk
why	*pourquoi*	poorkuah
and	*et*	ai
therefore	*ainsi*	anhsee
consequently	*par conséquent*	par conhsay-conh

ADVERBS

at first	*d'abord*	d'abor
previously	*auparavant*	oparravanh
afterward	*ensuite*	aunsweet
together	*ensemble*	aunsaumbl
at last	*enfin*	aunfanh
where	*où*	oo
here	*ici*	eesee
there	*là*	lah
elsewhere	*ailleurs*	aeellyure
above	*dessus*	dessu
below	*dessous*	dessoo
within	*dedans*	deddonh
without	*dehors*	dehor
everywhere	*partout*	partoo
nowhere	*nulle part*	nul par
up	*en haut*	aunh oh
down	*en bas*	aunh bah
anywhere	*quelque part*	kulk par
already	*déjà*	dayzhah
often	*souvent*	souvonh
sometimes	*quelque fois*	kulk-fwah
in future	*à l'avenir*	ah l'avneer
always	*toujours*	toozhoor
never	*jamais*	zhammay
soon	*bientôt*	beeanhtoe
immediately	*aussitôt*	oss-eetoe
late	*tard*	tar
early	*tôt*	toe
at present	*à présent*	ah praysonh
quickly	*vite*	veet
at once	*tout de suite*	too deh sweet
afterward	*puis*	pwee
yesterday	*hier*	yare
yesterday evening	*hier au soir*	yare o suahr
to-day	*aujourd'hui*	ojoordwee
to-morrow	*demain*	demmanh
to-morrow morning	*demain matin*	demmanh mattanh
to-morrow evening	*demain soir*	demmanh suahr
the day after to-morrow	*après demain*	appray demmanh
enough	*assez*	assay

English	French	Pronunciation
too much	*trop*	tro
little	*peu*	puh
much	*beaucoup*	bocoo
very	*très, fort*	tray, fore
more	*plus*	plu
less	*moins*	mouanh
at least	*au moins*	o mouanh
thus	*si*	see
nearly	*presque*	pressk
about	*environ*	aunhveeronh
all	*tout*	too
altogether	*tout-à-fait*	toot-ah-fay
only	*seulement*	suhlmonh
well	*bien*	beeanh
better	*mieux*	mee-uh
so much the better	*tant-mieux*	taunh mee-uh
bad	*mal*	mal
worse	*pis*	pee
rather	*plutôt*	pluto
without doubt	*sans doute*	saunh doot
indeed	*en effet*	aw-neffay
on the contrary	*au contraire*	o conhtrare
scarcely	*à peine*	ah pen
perhaps	*peut-être*	puh-taitr
all at once	*tout-à-coup*	tuht-ah-coo
not at all	*point du tout*	pouanh du too
not yet	*pas encore*	pah-zahnh-core
nothing	*rien*	reeanh
nothing at all	*rien du tout*	reeanh du too
with, near	*chez, auprès*	shay, opray
near	*près*	pray
in, within	*dans, en*	donh, aunh
before	*avant*	avvonh
behind	*derrière*	derriair
below	*sous*	soo
over	*sur*	sur
against	*vers*	vare
far from	*loin de*	luanh deh
on the side of	*à côté de*	ah cotay deh
opposite	*vis-à-vis*	veez-ah-vee
round about	*autour de*	otoor deh
instead of	*au lieu de*	o leeyu deh
in the midst of	*au milieu de*	o millyu deh
on this side	*en deçà de*	aunh-dessah de
on the opposite side	*au-delà de*	o-dellah-deh
out of	*hors*	or
after	*après*	appray
with	*avec*	avvec
since	*depuis*	deppwee
between	*entre, parmi*	aunhtr, parmee
without	*sans*	sanh
for	*pour*	poor
through, by	*par*	par
against	*contre*	conhtr
during	*pendant*	paundonh

NUMERAL ADJECTIVES

one, *un*, unh	80 *quatre-vingt*, katr-vanh
two, *deux*, duh	81 *quatre-vingt-un*, katr-vanhtunh
3 *trois*, trouah	82 *quatre-vingt-deux*
4 *quatre*, kahtr	83 *quatre-vingt-trois*
5 *cinq*, sanh	84 *quatre-vingt-quatre*
6 *six*, seece	85 *quatre-vingt-cinq*
7 *sept*, set	86 *quatre-vingt-six*
8 *huit*, wheet	87 *quatre-vingt-sept*
9 *neuf*, nuf	88 *quatre-vingt-huit*
10 *dix*, deece	89 *quatre-vingt-neuf*
11 *onze*, onhz	90 *quatre-vingt-dix*
12 *douze*, dooze	91 *quatre-vingt-onze*
13 *treize*, trayz	92 *quatre-vingt-douze*
14 *quatorze*, katorz	93 *quatre-vingt-treize*
15 *quinze*, kanhz	94 *quatre-vingt-quatorze*
16 *seize*, sayz	95 *quatre-vingt-quinze*
17 *dix-sept*, dee-sett	96 *quatre-vingt-seize*
18 *dix-huit*, deez-wheet	97 *quatre-vingt-dix-sept*
19 *dix-neuf*, deez-nuf	98 *quatre-vingt-dix-huit*
20 *vingt*, vanh	99 *quatre-vingt-dix-neuf*
21 *vingt-et-un*, vanh-tay-unh	100 *cent*, saunh
22 *vingt-deux*	101 *cent-un*
23 *vingt-trois*	110 *cent dix*
24 *vingt-quatre*	120 *cent vingt*
25 *vingt-cinq*	130 *cent trent*
26 *vingt-six*	200 *deux cents*
27 *vingt-sept*	300 *trois cents*
28 *vingt-huit*	400 *quatre cents*
29 *vingt-neuf*	500 *cinq cents*
30 *trente*, traunh	600 *six cents*
40 *quarante*, karaunh	700 *sept cents*
50 *cinquante*, sahnkaunh	800 *huit cents*
60 *soixante*, suahsaunh	900 *neuf cents*
70 *soixante-dix*	1,000 *mille*, meel
71 *soixante-et-onze*	2,000 *deux mille*
72 *soixante-douze*	3,000 *trois mille*
73 *soixante-treize*	10,000 *dix mille*
74 *soixante-quatorze*	20,000 *vingt mille*
75 *soixante-quinze*	a million, *un million*, unh meelyonh
76 *soixante-seize*	
77 *soixante-dix-sept*	
78 *soixante-dix-huit*	
79 *soixante-dix-neuf*	

The half, *la moitié* or *demi-* (prefix).
The third, *le tiers*. The fourth, *le quart*.
The fifth, *le cinquième*, etc., etc.
The double, *le double*. The triple, *le triple*.
Three (etc.) times as many, *trois* (etc.) *fois autant*.
Three (etc.) times more, *trois* (etc.) *fois plus*.
Three (etc.) times less, *trois* (etc.) *fois moins*.
Some twenty dollars, *une vingtaine de piastres*.
Some thirty men, *une trentaine d'hommes*.
Hundreds of men, *des centaines d'hommes*.

ORDINAL NUMBERS

the first,	*le premier*	leh premyai
" second,	*le second*	leh zeggonh
" third,	*le troisième*	leh trouazzeeame
" fourth,	*le quatrième*	leh kattreeame
" 5th,	*le cinquième*	leh sahnkeeame
" 6th,	*le sixième*	leh seeceeame
" 7th,	*le septième*	leh setteeame
" 8th,	*le huitième*	leh wheeteeame
" 9th,	*le neuvième*	leh neuveeame
" 10th,	*le dixième*	leh deezeeame
" 11th,	*le onzième*	leh ongzeeame
" 12th,	*le douzième*	leh doozeeame
" 13th,	*le treizième*	leh trayzeeame
" 14th,	*le quatorzième*	leh kattorzeeame
" 15th,	*le quinzième*	leh kahngzeeame
" 16th,	*le seizième*	leh sayzeeame
" 17th,	*le dix-septième*	leh deessettiame
" 18th,	*le dix-huitième*	leh deez-wheeteeame
" 19th,	*le dix-neuvième*	leh deezneuveeame
" 20th,	*le vingtième*	leh vahnteeame
" 21st,	*le vingt-et-unième*	leh vahng-eh-uneeame
" 30th,	*le trentième*	leh traunteeame
" 40th,	*le quarantième*	leh karaunteeame
" 50th,	*le cinquantième*	leh sahnkauntee-ame
" 60th,	*le soixantième*	leh souahssauntee-ame
" 70th,	*le soixante-dixième*	leh souahssaunt-deezeeame
" 80th,	*le quatre-vingtième*	leh kattr-vauntee-ame
" 90th,	*le quatre-vingt-dixième*	leh kattr-vaundee-zeeame
" 100th,	*le centième*	leh saunteeame
" 1,000th,	*le millième*	leh milleeame

Firstly, *premièrement* or *unièmement*.
Secondly, *secondement* or *deuxièmement*.

FORMATION OF NUMERALS.—As may be seen from this list, the numerals in French are formed precisely as in English, with the exceptions that, instead of seventy, they say "sixty-ten"; instead of eighty, "four-score"; and, instead of ninety, "four-score-ten." It will be noticed, therefore, that 71, 72, 73, etc., are given as sixty-eleven, sixty-twelve, sixty-thirteen, etc., while 91, 92, etc., are four-score-eleven, four-score-twelve, etc. In five cases only, the *un* is connected to the larger numeral by the conjunction *et*, and these are 21, 31, 41, 51, 61: in one case the *onze* takes the conjunction—71. In all other cases the *un* follows the leading numeral directly.

OUTLINES OF FRENCH GRAMMAR

DECLENSIONS

THE DEFINITE ARTICLE is rendered by *"le"* before a masculine noun, and by *"la"* before a feminine noun, as *le père*, the father; *la mère*, the mother. The plural for both genders is *"les,"* as: *les pères*, the fathers; *les mères*, the mothers.

MASCULINE

Singular

Nom. *le* (leh) *père*, the father
Gen. *du* (du) *père*, of the father
Dat. *au* (o) *père*, to the father
Acc. *le* (leh) *père*, the father

Plural

Nom. *les* (lai) *pères*, the fathers
Gen. *des* (dai) *pères*, of the fathers
Dat. *aux* (o) *pères*, to the fathers
Acc. *les* (lai) *pères*, the fathers

FEMININE

Singular

Nom. *la mère*, the mother
Gen. *de la mère*, of the mother
Dat. *à la mère*, to the mother
Acc. *la mère*, the mother

Plural

Nom. *les mères*, the mothers
Gen. *des mères*, of the mothers
Dat. *aux mères*, to the mothers
Acc. *les mères*, the mothers

In the declension of a word beginning with a vowel or a silent *"h,"* the definite article becomes *l'* in the singular. Thus:

Singular

Nom. *l'homme*, the man
Gen. *de l'homme*, of the man
Dat. *à l'homme*, to the man
Acc. *l'homme*, the man

Plural

Nom. *les hommes*, the men
Gen. *des hommes*, of the men
Dat. *aux hommes*, to the men
Acc. *les hommes*, the men

THE INDEFINITE ARTICLE is merely the numeral adjective *un*, "one." It has a suffixed *e* before feminine nouns. Thus:

Masculine

Nom. *un jardin*, a garden
Gen. *d'un jardin*, of a garden
Dat. *à un jardin*, to a garden
Acc. *un jardin*, a garden

Feminine

Nom. *une ville*, a town
Gen. *d'une ville*, of a town
Dat. *à une ville*, to a town
Acc. *une ville*, a town

In the declension of proper names articles are omitted, the prepositions being used before the nouns. Thus:

Masculine

Nom. *Paris*, Paris
Gen. *de Paris*, of Paris
Dat. *à Paris*, to Paris
Acc. *Paris*, Paris

Feminine

Nom. *Louise*, Louisa
Gen. *de Louise*, of Louisa
Dat. *à Louise*, to Louisa
Acc. *Louise*, Louisa

ADJECTIVES

The French adjectives are placed either before or after the noun, as:

le bon père, the good father
la bonne mère, the good mother

un bon garçon, a good boy
une jeune fille, a young girl

une table ronde, a round table
du lait chaud, warm milk

FEMININE TERMINATIONS.—Most adjectives form their feminine declension by adding *e*. However, if already ending in mute *e*, the feminine is the same as the masculine. If it be a verbal adjective (past participle) in *é*, the feminine becomes *ée*.

With adjectives ending in *el*, *en*, *et*, *on*, the feminines become *elle*, *enne*, *ette*, *onne*. But *secret* has *secrète*.

With adjectives ending in *f*, the feminines become *ve*.

With adjectives ending in *x*, the feminines become *se*.

With adjectives ending in *eur*, the feminines become *euse*.

With adjectives ending in *teur*, if not derived from a present participle, the feminines become *trice*.

All adjectives conform to these rules except the following: *bas, basse; blanc, blanche; complet, complète; doux, douce; épais, épaisse; faux, fausse; favori, favorite; frais, fraîche; franc, franche; gentil, gentille; gras, grasse; grec, grecque; gros, grosse; las, lasse; long, longue;*

malin, maligne; pareil, pareille; public, publique; sec, sèche; secret, secrète; sot, sotte. There are also a few adjectives that form their feminines from obsolete and rare forms of the masculine. Thus: *beau* (*bel*), *belle; fou* (*fol*), *folle; nouveau* (*nouvel*), *nouvelle; vieux* (*viel*), *vieille.* The same rules apply to the formation of feminines from masculine nouns denoting natural sex, unless a different word already express the feminine.

PLURAL TERMINATIONS.—Most nouns and adjectives form their plural by adding *s*, as in English, but there are a number that either remain unchanged or take a plural suffix ending in *x*. They may be classified as follows:

(1.) Nouns and adjectives ending with *s*, *x*, or *z* in the singular remain unchanged in the plural.

(2.) Nouns and adjectives ending with *au* and *eu* in the singular add *x* to form their plurals. Also six nouns in *ou* add *x* instead of *s: bijou*, a jewel; *caillou*, flint; *chou*, cabbage; *genou*, knee; *hibou*, owl; *joujou*, toy.

(3.) Nouns and adjectives ending with *al* in the singular take *aux* in the plural, as do also the following six masculine nouns in *ail: bail*, lease; *corail*, coral; *l'email*, enamel; *soupirail*, ventilator; *travail*, work; *vitrail*, glass window.

Adjectives agree in case, gender, and number with the nouns they govern, and are declined precisely like nouns with the articles and prepositions. In most cases the position of the adjective with the noun is indifferent, but with some adjectives the meaning varies widely as they precede or follow the noun. This is determined largely by general usage, rather than by any logical or grammatical reasons, and also by the noun used. Thus:

BON following means *good;* preceding, it has the force of "good" in the sense of familiar address—"my good man"—or of indicating simplicity, etc., frequently, social advantage, as *bon ton.*

BRAVE following means *worthy* rather than *brave.*

CERTAIN following means *positive;* preceding, *particular.*

COMMUN following means *vulgar;* preceding, *general, unanimous,* etc.

FURIEUX following means *enraged, angry;* preceding, *terrible.*

GENTIL following means *polite, well-bred, gay;* preceding *man, woman,* etc., *noble.*

GRAND following means *large* physically; preceding, *great* morally, mentally, or in reputation.

HAUT following means *loud, high;* preceding, *lofty* in manner, *arrogant.*

HONNÊTE following, *polite;* preceding, *honest.*

MAUVAIS following, *vulgar, bad outwardly;* preceding, *bad* morally or inwardly, *ill-natured.*

MÉCHANT following, *naughty, wicked;* preceding, *poor, ill-thought, "no good."*

MORTEL following, *mortal, liable to die;* preceding, *deadly,* as of a poison, enemy, etc.

NOUVEAU following, *new, new-made, new-fashioned;* preceding, *different, of another kind* than the last.

PETIT following, *mean, morally small;* preceding, *little, physically small.*

PLAISANT following, *amusing, agreeable;* preceding, *absurd, ridiculous.*

PROPRE following, *clean, proper, right;* preceding, *one's own, private.*

SEUL following, *alone, unaccompanied;* preceding, *single, unattached.*

TRISTE following, *sad, sorrowful;* preceding, *of poor sort.*

VILAIN following, *ugly* in face, etc.; preceding, *disagreeable, ugly-tempered.*

Several other adjectives thus distinguish their "outer" and "inner" meanings; some giving the moral idea when preceding the noun; others, when following. There is no rule for guidance in this matter.

COMPARISON OF ADJECTIVES

Adjectives are usually compared by preceding them with *plus,* "more," and *le* (or *la*) *plus,* "the most"; or, with *moins,* "less," and *le* (or *la*) *moins,* "the least." Thus:

grand, great; *plus grand,* greater; *le plus grand,* the greatest
petit, small; *plus petit,* smaller; *le plus petit,* the smallest

A few, however, are compared with a different word in the comparative degree; as:

peu, little; *moins,* smaller; *le moins,* the smallest
bon, good; *meilleur,* better; *le meilleur,* the best
mauvais, bad; *pire,* worse; *le pire,* the worst
petit, little; *moindre,* less; *le moindre,* the least
mal, bad; *pis,* worse; *le pis,* the worst

"Than" following the comparative is always translated by *"que."* Thus:

Il est plus poli que son frère—he is more polite than his brother.

PRONOUNS

THE PERSONAL PRONOUNS are declined as follows:

Je, I	*tu*, thou	*il*, he	*elle*, she
moi, me	*toi*, thee	*lui*, him	*elle*, her
me, me	*te*, thee	*le*, him	*la*, her
nous, we	*vous*, *you*	*ils*, they	*elles*, they
nous, us	*vous*, *you*	*eux*, them	*elles*, them
nous, us	*vous*, *you*	*les*, them	*les*, them

The first form in each paradigm is the nominative; the third, the objective; the second, the form taking prepositions, and indicating the indirect object.

When used before verbs, like *donner*, "to give," *parler*, "to speak," that should be followed by the preposition "to" in English, the following forms occur: *me*, "me, to me"; *te*, "thee, to thee"; *lui*, "to him, to her"; *le*, "him, it"; *la*, "her, it"; *nous*, "us, to us"; *vous*, "you, to you"; *leur*, "to them"; *les*, "them" (masc. or fem.). These are, in general, the forms of the indirect object. Where two pronouns, one indicating the direct, the other, the indirect, object, occur with one verb—as *Je le leur rendrais, si je l'avais*, "I would return it to them, if I had it"—the first person precedes the second or third, and the second, the third, with the forms, *lui* or *leur* always last. With the direct imperative, however, the pronoun expressing the indirect object always follows that expressing the direct object. Thus: *Donnez-le-moi*, "Give it to me"; *Donnez-le-leur*, "Give it to them."

The first person singular gives *moi*, as the indirect object after a direct imperative, but *me* before every verb and with a negative imperative. Thus, *Ne me le donnez pas*, "Do not give it to me." So, with other persons, the prepositional forms are used in this construction.

The form, *moi*, is also used after a verb, in answer to a question requiring the answer "I" or "myself" in English. Thus, *moi* or *c'est moi*, for "It is I." So, also, *c'est toi, c'est lui, c'est vous, c'est eux.*

THE PRONOMINAL OR POSSESSIVE ADJECTIVES, like all other adjectives, agree in gender and number with the noun following them, and are declined like nouns and adjectives. Thus: "my" is translated by *mon* (M), *ma* (F), *mes* (plural); "thy," by *ton* (M), *ta* (F), *tes* (plural); "his, her, its," by *son* (M), *sa* (F), *ses* (plural); "our," by *notre* (M and F), *nos* (plural); "your," by *votre* (M and F), *vos* (plural); "their," by *leur* (M and F), *leurs* (plural).

Pronominal adjectives govern all nouns, subjects, or objects, except parts of the body. In such cases, the pronoun of indirect object before the verb is used, with the part indicated as direct object. Thus, instead of saying, "They broke his leg," the French gives it, "They broke to him the leg." If, however, the sense is that "He broke his [own] leg," the form is simply, "He broke the leg," without the pronoun. With the three words, *mal*, *froid*, and *chaud*, the verb, *avoir*, is used with the noun of place governed by *à*. Thus, "My feet are cold" becomes, "I have cold to the feet," *J'ai froid aux pieds;* "His head is sore," *Il a mal à la tête.*

THE POSSESSIVE PRONOUNS are *le mien, la mienne*, "mine"; *le tien, la tienne*, "thine"; *le sien, la sienne*, "his, hers, its"; *le* or *la nôtre*, "ours"; *le* or *la vôtre*, "yours"; *le* or *la leur*, "theirs." The plural in each case is regularly formed by the addition of *s*. These pronouns always agree in *gender* and *number* with the thing possessed, and in *person* with the possessor.

THE FRENCH DEMONSTRATIVE ADJECTIVE is *ce* (before a consonant), *cet* (before a vowel), *cette*, feminine, and means "this" or "that"; with the plural for both genders, *ces*, meaning "these" or "those." In order to distinguish "this" from "that," when two like nouns are compared, *ci* (here) is appended to the one, and *la* (there), to the other. Thus: *Cet homme-ci est plus jeune que cet homme-la*, "This man is younger than that man."

THE DEMONSTRATIVE PRONOUNS are *celui* (M), *celle* (F), *ceux* (M plural), *celles* (F plural). They may be used in simple contrast with demonstrative adjectives; as, *Ces hommes sont meilleurs que ceux*, or in contrasting "this" and "that" by appending *ci* and *la*, as already explained. Thus: *Celui-ci est meilleur que celui-la;* or *Cet homme-ci est plus fort que celui-la.* When, however, the subject of the verb is indicated, but not expressed, or is understood from previous reference, *ceci* or *cela* is used. Thus: *Je prendrai ceci, je vous donnerai cela*, "I shall take this, I shall give you that."

THE RELATIVE PRONOUN, "who, which, that," is translated by *qui* in the nominative, when subject of a verb, and "whom, which, that," by *que*, when the object. When, however, "which" is preceded by a pronoun, it is rendered by *lequel* (M), *laquelle* (F), *lesquels* (M *plural*), *lesquelles*

(F plural). Thus, *Voici la maison dans laquelle je suis né,* "This is the house in which I was born." The rule generally followed, however, is to use *où,* "where," or *d'où,* or *par où,* in cases permitting "where" to be substituted for "which." Thus: *Voici la maison où je suis né.*

Lequel as subject of a verb, or in any construction in which it is followed by "of," *de,* means "which one of," and is generally used interrogatively. It is declined like the definite article. Thus: *lequel, duquel, auquel; laquelle, de laquelle, à laquelle; lesquels, desquels, auxquels; lesquelles, desquelles, auxquelles.* To illustrate its use: *Laquelle de ces demoiselles est votre fille,* "Which one of these young ladies is your daughter?" *Auquel de ces hommes avez-vous ecrit,* "To which one of these men have you written?"

The interrogative pronoun is *qui* in both nominative and accusative cases, when "who" is the meaning, but *quoi* occurs with prepositions when "what" is understood. "Whose" is necessarily rendered by *à qui.* Thus: "Whose is this house," *À qui est cette maison?* or *À qui appartient cette maison?* "Of what" is similarly rendered. Thus: *À quoi pensez-vous,* "Of what are you thinking?"

In simple questions of "who" or "what," the expression *qu'est-ce qui* occurs with subject clauses and *qu'est-ce que,* with object clauses. Thus: *qu'est-ce qu'il a dit,* "What did he say?" *Qu'est-ce qui venit,* "Who is it that comes?"

In asking questions with "what," not followed by nouns, the regular construction is to use *quel* (M), *quelle* (F), *quels* (M plural), *quelles* (F plural). Thus, *Quelles sont les heures des repas?* "What are the hours for meals?" As may be seen, the *quelles* in this sentence agrees in gender and number with *heures,* to which it refers.

PRONOMINAL IDIOMS.—Among French pronominal idioms we may mention the use of the indefinite pronoun *on* or *l'on* in an impersonal sense. Thus, *on dit,* "One says," or, as in colloquial English, "They say." This word is often used, also, in expressions we would render by the impersonal passive. Thus, we would say, "Do as you are told," but the French render it, *Fait qu'on vous a commandé,* "Do as one has commanded you."

EN.—Other idiomatic constructions are found in the uses of *en* and *y* with pronominal significations. Thus, while "some" with a noun is rendered by *de* with or without the definite article, as *du pain,* "some bread," *d'argent,* "some money," it is indicated by *en,* when the proper noun is not expressed, but understood. *Oui, j'en ai,* "Yes, I have some"; *Non, je n'en ai pas,* "No, I have none." *En* also expresses "some," "any," and "many," when referring to plurals. Thus, *Avez vous mes livres,* "Have you my books?" *Oui, j'en ai,* "Yes, I have some."

S'EN.—Some intransitive verbs having a pronominal form of conjugation take *s'en* instead of *se.* Thus, *s'en aller, s'en amuser.* The verb *s'en aller* is the idiomatic form for "to go away," and is conjugated through all tenses with *m'en, t'en, s'en, nous en, vous en, ils en.*

Y.—The adverb, *y,* usually means "there," as in English, even in the expression *Il y a,* "There are" (literally, "It has there"), but it has the force of "to it" and "to them" in very many sentences. Thus, "You have many virtues, but add moderation to them (*y*), and you will be better."

THE CONJUGATION AND SYNTAX OF FRENCH VERBS

THE FRENCH VERB is sufficiently like the English, in its general construction, to be readily understood by the student, after a few preliminary explanations:

(1.) It has simple tenses, as in English, formed by varying the suffixes attached to the root; and compound tenses, formed with inflections of the auxiliary verb, "to have," with the past participle of the main verb.

(2.) It forms its passive voice, as in English, with inflections of the auxiliary verb, "to be," with the past participle of the main verb.

It does not, however, use the verb, "to be," with the present participle, as in the English forms, "I am going," "I was thinking"; nor does it use the verb, "to do," as an auxiliary in any case.

Thus, in rendering a question into French, we say, "Think you," *not* "Do you think": "Loved you," *not* "Did you love."

MOODS.—The French verb has five moods; the *indicative,* the *conditional,* the *subjunctive,* the *imperative,* and the *infinitive*—the *participles* not properly forming a mood.

The *imperative* is always in the present tense, as indicating that the verb-idea is expressed as a command; as, "Do thou"; "Do ye this"; "Let us do this."

The *infinitive* is in two tenses, the *present*

and the *past*, as in English. Thus, "to have" and "to have had."

The *indicative* mood has eight tenses. Four of these are simple (*absolu*); the *present*, the *imperfect*, the *preterit* (or *past definite*), and the *future*. Four are compounded (*antérieur*) with the auxiliary verb, "to have"; the *perfect* (or *present anterior*), the *pluperfect*, the *past anterior* and the *future anterior*.

The *conditional* mood has two tenses; one simple—the *present*—and one compound—the *past*.

The *subjunctive* mood has two simple tenses—the *present* and *imperfect*—and two compound tenses—the *past* and the *pluperfect*.

TENSES.—Regarding the uses of the several tenses, there are a number of points that should be made clear to the student at the start.

The uses of the *present* and *future* tenses are clear to any one: the former signifying, "I do," or "I am doing" anything, indicating either the occupation of the present moment, or a habit or custom still followed; the latter indicating what will be in the future, in either of these senses, as "I shall do," or "I shall be doing" anything.

DESCRIPTIVE TENSES.—The *imperfect* and the *pluperfect* indicate either unfinished or customary or continued action, not necessarily finished or unfinished, in a past, less or more remote. In these respects, they resemble the Latin tenses of the same names.

Thus, the *imperfect* tense has the force of "I did," "I was doing," or "I used to do," or "I was accustomed to do" anything at times previous to the present. Example: *Je travaillais toutes cettes années*, "I was working all these years."

The *pluperfect* tense has a precisely similar force in referring to habits or continued actions in times previous to a certain definite past. It has the force of "I had done," or "I had been doing" anything. Thus, if one be speaking of the year 1900, and refers to doings in a time previous, he uses the *pluperfect*.

In the same way, the *imperfect* and *pluperfect subjunctive* indicate continued or unfinished action in a conditional past, less or more remote, generally with *que* (that), as in "I wish that I had been doing." The *pluperfect subjunctive* is sometimes used as a second form of the conditional past, without *que*, in the sense of "I would have done" so and so, if, etc.

NARRATIVE TENSES.—The *perfect*, the *preterit* (or *past definite*), and the *past anterior* of the *indicative mood* are used in narrations to indicate actions performed at some single or definite time, and do not indicate habits or customary actions.

Thus, the *perfect*, while usually translated "I have done," has, more properly, a *present anterior* force, as in Latin; as *Je lui ai donné cette maison*, "I gave him this house." The force of the tense is either, that the effect of the action still continues—thus, the man is still in possession of the house given him—or, else, that the matter of the completeness or incompleteness is not referred to. Thus, I may have *completed* the action indicated in the above sentence by transferring the title to the house, or I may merely have indicated my intention so to do.

If the *perfect tense*, judging by the context of the sentence, indicates an action definitely completed, the *exact time* of the action is not indicated. Thus, it is frequently called the *past indefinite*.

The *preterit tense* indicates action definitely completed, both in the doing and in the effect, and is used in the *historical sense*. It is the true equivalent of the English "I did" or "I did do." Thus, we would not say of Julius Cæsar, for example, "He has done"—except in poetry or lively narrative—but always, "He did." Thus, *Le roi donna cinq louis au paysan, et lui pardonna sa faute*, "The king gave five louis to the peasant, and pardoned his offence."

The *past anterior* tense, which is always formed from the *preterit* of the verb, "to have," with the *past participle* of the main verb, except with verbs conjugated with "to be," indicates action at a period previous, or anterior, to the time of the action narrated. It is always preceded by one of these adverbs: *à peine* (scarcely), *aussitôt que* (as soon as), *dès que* (as soon as), *lorsque* (when) and *quand* (when). Thus, *Aussitôt qu'il eut fini son travail, il partit pour la campagne*, "As soon as he had finished his work, he left for the country."

The *future* and *future anterior tenses* have the same force as the English *future* and *future perfect*. Thus, when speaking of some definite time, say next week, we would say, "Then I shall have the money," expressing what will be present at the time referred to. But, if we say, "Then I shall have received the money," we express an action anterior to the definite future, and one supposedly complete at that time. In other words, the *future anterior* is to the *future* what the *perfect* or *preterit* is to the *present*.

THE CONDITIONAL MOOD.—The use of the *conditional mood* is to express ideas rendered with "would, could, should," and "would have, could have, should have" in English. It is also used in very many cases where we give an "if," or where the nearly obsolete English subjunctive should occur. Thus, "If I could have"; "Might I see"; "If I were"; "Had I," and other constructions expressing contingency.

USE OF "IF."—It must be carefully noticed, however, that neither the *future tense* nor the *conditional mood* is used with "if" (*si*) in French. Where we would give the *future* after "if," the French give the *present;* where we give the *conditional,* they give the *imperfect* indicative. Thus, *Seriez-vous* (conditional) *aussi gaie que votre sœur si vous étiez* (imperfect) *aussi riche qu'elle?* "Would you also be as gay as your sister if you were also as rich as she?"

THE SUBJUNCTIVE MOOD.—The *subjunctive mood* in French—except in the rare uses of the *pluperfect,* as noted above—fulfils its original use as a *subjoined,* or dependent, construction, as in Latin. Thus, it is always inflected with *que* (that) preceding the subject, indicating dependence upon the main idea of the sentence—as "I wish"; "I desire," etc.—expressed or implied.

CONJUGATION OF AUXILIARIES

THE VERB, "AVOIR," TO HAVE

INFINITIVE MOOD

Present	*Past*
Avoir, to have	*Avoir eu,* to have had

PARTICIPLES

Ayant, having	*Eu,* had
	ayant eu, having had

INDICATIVE MOOD

Present

I have	*J'ai*
thou hast	*tu as*
he has	*il a*
we have	*nous avons*
you have	*vous avez*
they have	*ils (elles) ont*

*Imperfect**

I had	*J'avais*
thou hadst	*tu avais*
he had	*il avait*
we had	*nous avions*
you had	*vous aviez*
they had	*ils avaient*

* Note that the *ai* in the *imperfect indicative* and *present conditional* of all verbs is pronounced short, like *e* in "yet."

Past Definite

I had	*J'eus*
thou hadst	*tu eus*
he had	*il eut*
we had	*nous eûmes*
you had	*vous eûtes*
they had	*ils eurent*

Future

I shall have	*J'aurai*
thou shalt have	*tu auras*
he shall have	*il aura*
we shall have	*nous aurons*
you shall have	*vous aurez*
they shall have	*ils auront*

CONDITIONAL MOOD

*Present**

I should have	*J'aurais*
thou shouldst have	*tu aurais*
he should have	*il aurait*
we should have	*nous aurions*
you should have	*vous auriez*
they should have	*ils auraient*

SUBJUNCTIVE MOOD

Present

That I may have	*Que j'aie*
that thou mayst have	*que tu aies*
that he may have	*qu'il ait*
that we may have	*que nous ayons*
that you may have	*que vous ayez*
that they may have	*qu'ils aient*

Imperfect

That I might have	*Que j'eusse*
that thou mightst have	*que tu eusses*
that he might have	*qu'il eût*
that we might have	*que nous eussions*
that you might have	*que vous eussiez*
that they might have	*qu'ils eussent*

IMPERATIVE MOOD

Have	*Aie*
let us have	*ayons*
have (ye)	*ayez*

All the other tenses are "compound," or formed, as in English, with the present, imperfect, past definite, future, conditional present, and subjunctive perfect and imperfect, as auxiliaries to the past participle *eu.*

As this verb is typical of the construction of all others, the following examples of compound tenses are given for the student's guidance in expression:

PERFECT INDICATIVE

I have had, *j'ai eu*

PLUPERFECT INDICATIVE

I had had, *j'avais eu*

PAST ANTERIOR

I had had, *j'eus eu*

FUTURE ANTERIOR

I shall have had, *j'aurai eu*

PAST CONDITIONAL

I should have had, *j'aurais eu*

PERFECT SUBJUNCTIVE

That I may have had, *que j'aie eu*

PLUPERFECT SUBJUNCTIVE

That I might have had, *que j'eusse eu*

The inflection of all these tenses proceeds precisely as in the paradigms already given above.

THE VERB, "ÊTRE," TO BE

INFINITIVE MOOD

Present	*Past*
Être, to be	*Avoir été,* to have been

PARTICIPLES

Étant, being	*Été,* been
	ayant été, having been

INDICATIVE MOOD

Present

I am	*Je suis*
thou art	*tu es*
he is	*il est*
she is	*elle est*
we are	*nous sommes*
you are	*vous êtes*
they are	*ils (elles) sont*

Imperfect

I was	*J'étais*
thou wast	*tu étais*
he was	*il était*
we were	*nous étions*
you were	*vous étiez*
they were	*ils étaient*

Past Definite

I was	*Je fus*
thou wast	*tu fus*
he was	*il fut*
we were	*nous fûmes*
you were	*vous fûtes*
they were	*ils furent*

Future

I shall be	*Je serai*
thou shalt be	*tu seras*
he shall be	*il sera*
we shall be	*nous serons*
you shall be	*vous serez*
they shall be	*ils seront*

CONDITIONAL MOOD

Present

I should be	*Je serais*
thou shouldst be	*tu serais*
he should be	*il serait*
we should be	*nous serions*
you should be	*vous seriez*
they should be	*ils seraient*

SUBJUNCTIVE MOOD

Present

That I may be	*Que je sois*
that thou mayst be	*que tu sois*
that he may be	*qu'il soit*
that we may be	*que nous soyons*
that you may be	*que vous soyez*
that they may be	*qu'ils soient*

Imperfect

That I might be	*Que je fusse*
that thou mightst be	*que tu fusses*
that he might be	*qu'il fût*
that we might be	*que nous fussions*
that you might be	*que vous fussiez*
that they might be	*qu'ils fussent*

IMPERATIVE MOOD

Be	*Sois*
let us be	*soyons*
be (ye)	*soyez*

REGULAR VERBS

THE INFINITIVES of verbs in the French language have the four following terminations:

er—as in *donner,* to give,
ir—as in *finir,* to finish,
evoir—as in *recevoir,* to receive,
re—as in *vendre,* to sell.

All that precedes this infinitive termination is called the *"root"* of the verb.

Verbs that change only their terminations, and not their roots, are called *"regular Verbs"*; those which change their roots, *"irregular Verbs."*

The Verbs ending in *"oir"* are all irregular, and the French language, therefore, has in reality only three regular Conjugations.

The first Conjugation ends in *"er."*
The second Conjuagtion ends in *"ir."*
The third Conjugation ends in *"evoir."*
The fourth Conjugation ends in *"re."*

THE PAST PARTICIPLE is formed by adding to the root of the first Conjugation an *"é,"* to that of the second an *"i,"* to the third and fourth a *"u,"* as:

Donn-er, to give; *donné,* given.
Fin-ir, to finish; *fini,* finished.
Recevoir, to receive; *reçu,* received.
Vend-re, to sell; *vendu,* sold.

FIRST CONJUGATION

INFINITIVE MOOD

Present	*Past*
Donner, to give	*Avoir donné,* to have given

PARTICIPLES

Donnant, giving — *Donné,* given
ayant donné, having given

INDICATIVE MOOD

Present	*Past Definite*
I give	I gave
Je donne	*Je donnai*
tu donnes	*tu donnas*
il donne	*il donna*
nous donnons	*nous donnâmes*
vous donnez	*vous donnâtes*
ils donnent	*ils donnèrent*

Imperfect	*Future*
I gave	I shall give
Je donnais	*Je donnerai*
tu donnais	*tu donneras*
il donnait	*il donnera*
nous donnions	*nous donnerons*
vous donniez	*vous donnerez*
ils donnaient	*ils donneront*

CONDITIONAL MOOD

Present

I should give
Je donnerais
tu donnerais
il donnerait
nous donnerions
vous donneriez
ils donneraient

SUBJUNCTIVE MOOD

Present	*Imperfect*
That I may give	That I might give
Que je donne	*Que je donnasse*
que tu donnes	*que tu donnasses*
qu'il donne	*qu'il donnât*
que nous donnions	*que nous donnassions*
que vous donniez	*que vous donnassez*
qu'ils donnent	*qu'ils donnassent*

IMPERATIVE MOOD

Donne, give thou — *Donnons,* let us give
donnez, give ye

SECOND CONJUGATION

INFINITIVE MOOD

Present	*Past*
Finir, to finish	*Avoir fini,* to have finished

PARTICIPLES

Finissant, finishing — *Fini,* finished
ayant fini, having finished

INDICATIVE MOOD

Present	*Past Definite*
I finish	I finished
Je finis	*Je finis*
tu finis	*tu finis*
il finit	*il finit*
nous finissons	*nous finîmes*
vous finissez	*vous finîtes*
ils finissent	*ils finirent*

Imperfect	*Future*
I finished	I shall finish
Je finissais	*Je finirai*
tu finissais	*tu finiras*
il finissait	*il finira*
nous finissions	*nous finirons*
vous finissiez	*vous finirez*
ils finissaient	*ils finiront*

CONDITIONAL MOOD

Present

I should finish
Je finirais
tu finirais
il finirait
nous finirions
vous finiriez
ils finiraient

SUBJUNCTIVE MOOD

Present	*Imperfect*
That I may finish	That I might finish
Que je finisse	*Que je finisse*
que tu finisses	*que tu finisses*
qu'il finisse	*qu'il finît*
que nous finissions	*que nous finissions*
que vous finissiez	*que vous finissiez*
qu'ils finissent	*qu'ils finissent*

IMPERATIVE MOOD

Finis, finish — *Finissons,* let us finish
finissez, finish ye

THIRD CONJUGATION

INFINITIVE MOOD

Present	*Past*
Recevoir, to receive	*Avoir reçu,* to have received

PARTICIPLES

Recevant, receiving — *Reçu* (ressu), received
ayant reçu, having received

INDICATIVE MOOD

Present	*Past Definite*
I receive	I received
Je reçois	*Je reçus*
tu reçois	*tu reçus*
il reçoit	*il reçut*
nous recevons	*nous reçûmes*
vous recevez	*vous reçûtes*
ils reçoivent	*ils reçurent*

Imperfect	*Future*
I received	I shall receive
Je recevais	*Je recevrai*
tu recevais	*tu recevras*
il recevait	*il recevra*
nous recevions	*nous recevrons*
vous receviez	*vous recevrez*
ils recevaient	*ils recevront*

CONDITIONAL MOOD

Present

I should receive

Je recevrais
tu recevrais
il recevrait
nous recevrions
vous recevriez
ils recevraient

SUBJUNCTIVE MOOD

Present	*Imperfect*
That I may receive	That I might receive
Que je reçoive	*Que je reçusse*
que tu reçoives	*que tu reçusses*
qu'il reçoive	*qu'il reçût*
que nous recevions	*que nous reçussions*
que vous receviez	*que vous reçussiez*
qu'ils reçoivent	*qu'ils reçussent*

IMPERATIVE MOOD

Reçois, receive thou — *Recvons,* let us receive
recevez, receive ye

FOURTH CONJUGATION

INFINITIVE MOOD

Present	*Past*
Vendre, to sell	*Avoir vendu,* to have sold

PARTICIPLES

Vendant, selling — *Vendu,* sold
ayant vendu, having sold

INDICATIVE MOOD

Present	*Past Definite*
I sell	I sold
Je vends	*Je vendis*
tu vends	*tu vendis*
il vend	*il vendit*
nous vendons	*nous vendîmes*
vous vendez	*vous vendîtes*
ils vendent	*ils vendirent*

Imperfect	*Future*
I sold	I shall sell
Je vendais	*Je vendrai*
tu vendais	*tu vendras*
il vendait	*il vendra*
nous vendions	*nous vendrons*
vous vendiez	*vous vendrez*
ils vendaient	*ils vendront*

CONDITIONAL MOOD

Present

I should sell

Je vendrais
tu vendrais
il vendrait
nous vendrions
vous vendriez
ils vendraient

SUBJUNCTIVE MOOD

Present	*Imperfect*
That I may sell	That I might sell
Que je vende	*Que je vendisse*
que tu vendes	*que tu vendisses*
qu'il vende	*qu'il vendît*
que nous vendions	*que nous vendissions*
que vous vendiez	*que vous vendissiez*
qu'ils vendent	*qu'ils vendissent*

IMPERATIVE MOOD

Vends, sell thou — *Vendons,* let us sell
vendez, sell ye

THE PASSIVE VOICE

of French verbs is formed, as in English, with the past participle of the verb and the several parts of the auxiliary, *être,* "to be." Thus, for the verb, *aimer,* "to love":

INFINITIVE MOOD

Present

Être aimé, to be loved

Past

Avoir été aimé, to have been loved

INDICATIVE MOOD

Present

Je suis aimé, I am loved

Imperfect

J'etais aimé, I was loved

Preterit

Je fus aimé, I was loved

Future

Je serai aimé, I would be loved

CONDITIONAL MOOD

Present

Je serais aimé, I would be loved

SUBJUNCTIVE MOOD

Present

Que je sois aimé, that I be loved

Imperfect

Que je fusse aimé, that I might be loved

The tenses compounded in the active voice with inflections of *avoir,* "to have,"

are formed with the past participles of both *être* and *aimer*. Thus:

INDICATIVE MOOD

Past Indefinite

J'ai été aimé, I was or have been loved.

Pluperfect

J'avais été aimé, I had been loved

Past Anterior

J'eus été aimé, I had been loved

Future Anterior

J'aurai été aimé, I shall have been loved

CONDITIONAL MOOD

Past

J'aurais été aimé, I would have been loved

SUBJUNCTIVE MOOD

Past

Que j'aie été aimé, that I may have been loved

Pluperfect

Que j'eusse été aimé, that I might have been loved

The inflections in all persons are the same as in the models of the auxiliary verbs. With a feminine subject the *aimé* is changed to *aimée,* and in the plural it becomes *aimés,* except where but one person is indicated in the second person.

THE SYNTAX OF VERBS

AGREEMENT OF PARTICIPLES.—The past participle used with an active verb agrees with the object when the object precedes the verb in the sentence. Thus: *Voilà la maison que j'ai achetée,* "There is the house that I have bought." When the object follows the verb, the participle agrees in gender and number with the subject. Thus, *Nous avons achetés cette maison.*

USE OF THE PASSIVE.—The passive in French is not used as freely as in English. Hence many passive sentences are to be translated into the active constructions. Thus, instead of saying, "He was punished by his father," it is more idiomatic to say: *Son père l'a puni,* "His father punished him."

The active construction is always substituted for the English passive when the subject is impersonal or unexpressed. Thus, instead of saying, "Have you done what you were ordered?" the French has, *Avez vous fait ce qu'on vous a ordonné?* "Have you done that which one has ordered you?" The active with *on* or *l'on,* according to euphony, with an active verb forms the regular construction in such cases. Frequently, also, as in English, instead of saying that a thing "is sold" for so much, it is customary to say "it sells." So, 'it moves," "it runs," etc., instead of the logical passive forms.

NEGATION is regularly expressed by *ne—pas.* Thus: *Je n'aime pas,* "I do not love." A stronger negation is obtained by using *point* instead of *pas.* Thus: *Je n'aimé point,* "I do not love at all." The adverbs, *plus* and *jamais,* give the force of "no more" or "no longer," and of "never," respectively. The word, *pas,* is the most usual of the four, and is sufficiently emphatic for ordinary purposes. Several verbs, *pouvoir,* to be able; *oser,* to dare; *cesser,* to cease; and *savoir,* to know, may be used without *pas.* With *pouvoir* this construction is regular; thus, *Je ne puis finir ce travail,* "I can not finish this work." On the other hand, *savoir* generally takes *pas,* when the meaning is "not to have learned"; "not to have found out." *Savoir* frequently means "to be able," in the sense of "to know how."

Many grammars give complete conjugations of model verbs with negative constructions, but, for the purposes of the present treatise, it is necessary only to say that in simple tenses the word, *pas,* always closes the verb, as in the above sentence. Thus, *Je ne suis pas,* "I am not"; *Je ne fus pas,* "I was not"; *Que je ne sois pas,* "That I be not." In the compound tenses, *pas* precedes the past participle. Thus, *Je n'ai pas été,* "I have not been"; *Qu'il n'eut pas été,* "That he might not have been."

In asking questions, the words are merely inverted, as in the English classic usage. Thus, *A-t-il parlé,* "Has he spoken?" The *t* here is introduced, for sake of euphony, before the *il,* when the third person singular ends in a vowel. When that person ends in a consonant, the *il* is merely appended with a hyphen. In the first person singular indicative of all verbs, except *avoir* and *être,* the form of direct questions is like this model, *Est-ce que je parle?* "Am I speaking?"—literally, "Is it [true] that I speak." But, *Suis-je,* "Am I"; *Ai-je,* "Have I."

With negative questions the same constructions hold good; the negative particles being combined with the inverted verb elements. Thus: *Est-ce que je ne parle pas,* "Am I not speaking"; *N'ai je pas vendu,* "Did I not sell"; *N'aimerait-il pas,* "Would

he not love.". But; *Ne suis-je pas,* "Am I not"; and *N'ai-je pas,* "Have I not."

Negative expressions rendered in English by "but" or "only," as, "He has only [or "but"] one hat," are translated into French with *ne—que.* Thus: *Ne nous apportez qu'une demi-bouteille de vin,* "Bring us only one small bottle of wine," or "Don't bring us but one," etc. Also, *Il n'a que nous,* "He has [no one] but us"; *Les enfants ne paient que moitié prix,* "Children pay only half price"; *Je croyais que les places n'étaient que de vingt sous,* "I thought that the [railway] tickets were only twenty sous."

Verbs with Auxiliary "to be."—As in German and classic English, intransitive, or *neuter,* verbs take *être* instead of *avoir,* as the auxiliary. Among such verbs are *aller,* "to go"; *arriver,* "to arrive"; *descendre,* "to descend"; *entrer,* "to enter"; *monter,* "to ascend"; *partir,* "to leave, start, depart"; *rentrer,* "to re-enter"; *rester,* "to remain, stay"; *retourner,* "to return"; *revenir,* "to come back"; *sortir,* "to go out"; *tomber,* "to fall"; *venir,* "to come." Thus, we say, *Je suis arrivé,* "I am come"; *Ils sont partis,* "They are gone"; *Nous sommes allés,* "We are gone."

In addition to this list, the verbs, *naître,* "to be born," and *mourir,* "to die," take *être* in the compound tenses, giving *Il est mort,* "He is dead, or has died," and *Elle est née,* "She was born."

However, the verbs *monter,* meaning "to carry up," "lift up," "ride," etc., and *descendre,* meaning "to take down," "to bring down," "to put down," being transitive in these meanings, take the verb *avoir* in the compound tenses.

Pronominal Verbs.—All the pronominal verbs, called *reflexive,* take *être* in the compound tenses. Reflexive verbs express what one does to himself, and are always conjugated with the personal pronoun of the subject. Thus, the irregular reflexive verb, *s'asseoir,* "to sit," or "to seat one's self," is inflected *Je m'assieds, tu t'assieds, il s'assied, nous nous asseyons, vous vous asseyez, ils s'asseyent.* Since these verbs, taking two pronouns in the paradigm, or a pronominal object of the same person and number as the subject, are very numerous, and, also, indicate many acts rendered by perfectly regular verbs in English, a partial list is appended. Thus: *se cacher,* to hide (one's self); *se porter,* to be (well or ill); *se rendre,* to surrender (self); *s'abbaisser,* to stoop to; *s'accorder,* to agree; *s'appreter,* to prepare; *s'assujetir,* to submit; *s'attendre,* to expect; *se déterminer,* to determine; *s'obstiner,* to be obstinate; *s'occuper,* to be engaged; *se resondre,* to resolve. In addition to these, there are a large number of true reflexive verbs, such as appear in English with the grammatical objects, "myself," "yourself," "himself," "herself," "itself," and "ourselves," "yourselves," "themselves."

Of the *pronominal* verbs, known as reciprocal, the transitive take *avoir* in the compound tenses, and the *intransitive* take *être;* such verbs being merely specially constructed like reflexives. Thus, while the expression *Nous nous aimous* means "We love ourselves," the addition of *l'un l'autre* (or *l'une l'autre*), where two persons are concerned, or *les uns* (or *les unes*) *les autres,* where there are more than two, give the reciprocal meanings of "each other." Thus: *Nous nous aimons les uns les autres.*

Idioms with "avoir."—Several varieties of physical and mental condition, expressed in English by an adjective with the verb, "to be," are rendered in French by a noun with the verb, *avoir,* "to have." Thus:

To be afraid, *avoir peur.*
To be ashamed, *avoir honte.*
To be cold, *avoir froid.*
To be hungry, *avoir faim.*
To need, *avoir besoin.*
To be right, *avoir raison.*
To be sleepy, *avoir sommeil.*
To be thirsty, *avoir soif.*
To be warm, *avoir chaud.*
To be wrong, *avoir tort.*

Each of these expressions may be inflected through all the tenses of *avoir,* always followed by the appended noun, as direct object. The noun or clause, then, that should be the direct object in English becomes the indirect object in French, being governed by some preposition to be translated "for," etc. Thus: *Vous avez besoin de vos amis,* "You need your friends" (have need for your friends); *Il a honte de ses fautes,* "He is ashamed of his faults"; *J'ai plus de chaud,* "I am warmer."

In the same construction occurs the question as to age. Thus: *Quel âge a-t-il,* "How old is he?" The answer is usually expressed in the same idiom—thus, *Il a dix-sept ans,* "He is seventeen"—but the adjective, *âgé,* is often used, as in *Je suis âgé de dix ans,* "I am ten years old."

IMPERSONAL VERBS.—As in English, numerous impersonal constructions are used. Such an expression consists, in general, of the third person singular indicative of a verb, with *il*, "it"—as "It rains"; "It snows"—but a proper impersonal verb should be followed by the conjunction, "that," with a verbal clause, or by "for," with an infinitive. In French, as in English, very many impersonal expressions are formed with *il est*, "it is," and an adjective. Thus: *Il est bon que*, "It is good that"; *Il est vrai que*, "It is true that"; *Il est sûr que*, "It is sure that"; *Il est clair que*, "It is evident (clear) that," etc.; also, *Il est temps que*, "It is time that." Others are formed from special verbs. Thus: *Il résulte*, "It follows"; *Il s'ensuit*, "It follows"; *Il paraît*, "It appears." Also: *Il convient* or *Il est convenable*, "It behooves"; *Il vaut mieux* or *Il est préférable*, "It is better"; *Il importe* or *Il est important*, "It is of consequence."

Two common impersonal forms, quite foreign to English syntax, occur regularly in French. They are *Il faut*, "It is necessary," or "It must be that"; and *Il se peut*, "It may be," or "It is possible that." Thus, in using the expressions, "I must" or "He must," the regular idiom is *Il faut que*, followed by a subjunctive. Also, in many cases of doubt, etc., "I may" or "He may" is expressed by *Il se peut que*, with the subjunctive. This is the invariable construction when a noun is the logical subject of the sentence.

However, when the proposition of the sentence is either *general* or *self-evident*, and a pronoun is the subject, expressed or understood, *il faut* may be used with the infinitive. This construction, therefore, expresses general sayings, mottoes, etc., as "To prosper, we must work," *Pour prospérer, il faut travaillér.* Also, in such expressions as "It is time to go" or "We must go," without particular reference to the definite persons concerned. Thus: *Il faut partir.* With expressed pronouns, the same construction holds, as: *Il me faut partir aujourd'hui*, "I must go away today." *Quand lui faut il envoyer?*" "When must he send?" (When to him is it necessary to send?). In the same way with other conjugations of *falloir*: "How much would you need for rebuilding the house?" *Combien vous faudrait-il pour faire rebâtir la maison?*

MUST.—In conversations, this impersonal construction implies both "must" and "need." Thus: *Il faut que je fasse des achats*, "I must make some purchases"; but, *Combien vous faut-il?* "How much [money] do you need?" *Il me faut environ dix francs*, "I need about ten francs." Again: *Je vous quitte bien à regret, mais il faut*, "I leave you much to [my] regret, but it must [be]."

While speaking of French renderings of the English "must," we may give another form, which differs from *il faut*, as claimed by grammarians, in expressing inner or moral obligation, rather than the outer, circumstantial, or physical. Thus, if one say, "I must pay him," giving the "must" a particular emphasis as of a moral obligation, the translation would be *Je dois le payer.* The conjugations of *devoir*, however, more properly express the idea of the English "ought."

CONSTRUCTIONS WITH IMPERSONALS.—All impersonal verbs expressing *right, fitness, necessity*, or *uncertainty*, are followed by *que* with a subjunctive. But most verbs expressing *consequence, evidence*, or *certainty* are followed by *que* with the indicative. This rule is evidently carried out to a large extent in classic English. Thus, we say: "It is right that he be"; but "It is certain that he is."

SUBJUNCTIVES AND INFINITIVES.—An important subject in French grammar is the construction of subjunctive and infinitive clauses, expressing *dependence, consequence, purpose*, etc.

SUBJUNCTIVE CONSTRUCTIONS.—In addition to the constructions already specified, the following verbs are followed by *que* with the *subjunctive: complaining, doubting, fearing, enjoying, expecting, forbidding, permitting, sorrowing, being surprised, willing, wishing*, and of emotions in general. These verbs, however, regularly take *ne*, "lest," before the *subjunctive: avoir peur, craindre* and *trembler*, all meaning "to fear," and *prendre garde*, "to beware," and *empêcher*, "to prevent." Used negatively or interrogatively, they omit the *ne*, except in the negative clause, with *pas*, and are followed by *que* with the subjunctive. All other verbs used negatively or interrogatively are followed by *que* with the subjunctive; as, *Croyez vous que j'aie fini le travail*, "Do you believe that I have finished the work."

The *subjunctive* introduced by *que* follows all superlative expressions with "that"—also *le seul*, "the only one"—except where the superlative is followed by a genitive plural (the partitive genitive). Thus:

Elle est la plus belle femme que j'aie jamais vu, "She is the most beautiful woman I ever saw"; but *Il est le plus noble de touts les hommes que je connais,* "He is the noblest of all the men that I know."

The subjunctive follows these conjunctions: *afin que,* and *pour que,* "in order that"; *pourvu que,* "provided that"; *supposé que,* "supposing that," as in English. It also follows these conjunctions, usually taking a participle in English: *avant que,* "before"; *quoique* and *bien que,* "although"; *jusqu'à ce que,* "until," and *sans que,* "without." The conjunctions, *à moins que,* "unless," and *de craintre que* and *de pour que,* "lest," take the subjunctive preceded by *ne.*

Sequence of Tenses.—Except in sentences implying a condition in the main clause, the *present subjunctive* always follows the *present* or *future indicative.* With *compound tenses* of the *subjunctive,* the auxiliary verb takes the *present tense* after a *present* or *future indicative.* The *imperfect subjunctive* follows a *simple past tense* of the *indicative* or *conditional,* and its *compound tenses,* when required by the sense, take the *imperfect* of the auxiliary, under the same conditions. Thus: *Il parlait beaucoup, bien qu'il fût si malade,* "He talked a great deal, although he was so sick."

Use of Infinitives.—In many sentences having the same general form as those including a subjunctive clause, the infinitive is used instead:

(1.) When two verbs come together, the second is put into the infinitive, unless the first be *avoir* or *être.*

(2.) When two verbs have the same subject, the second is put into the infinitive.

(3.) The second of two verbs goes into the infinitive, when its subject is different from that of the first, but perfectly obvious.

In these cases we have, instead of the subjunctival conjunctions given above, any one of the following correspondent prepositions: *afin de, pour, avant de* or *avant que de, sans, à moins de* or *à moins que de, de crainte de* or *de peur de* and *jusque,* with the same English meanings as the similar conjunctions.

As in English, the usual construction is to use the infinitive in such sentences with a preposition meaning *to* or *for to.* Many verbs, however, are followed by the infinitive, without a preposition, as in the English sentences: "Let us go call him"; "We will come see you." Of other verbs some take *à,* "to," and others *de,* "of."

The Verbs "avoir" and "être" take either *à* or *de* before an infinitive, according to circumstances. Thus, *avoir* is followed by *de* with the infinitive, when the sense requires that the infinitive be active, and not passive, as with such expressions as "have the kindness to"; "have opportunity to"; "have the intention to"; and the idioms for "be hot"; "be cold"; "be right," etc., as already given. *Avoir* takes *à* before the infinitive of the second verb, when that infinitive can be expressed by the passive infinitive, although the passive may not be used; as, *J'ai trois amis à visiter,* "I have three friends to visit" (or "to be visited").

The verb *être* takes *de* with an infinitive when used *impersonally* with an adjective, as *Il est plaisant,* etc. It takes *à* before the infinitive when used with *ce* or *cela* before an adjective, as *c'est facile,* etc.

The use of infinitive constructions is preferable in both French and English, for the purpose of simplifying sentences, and, as a consequence, they are used in both languages for expressing very nearly the same line of ideas. Thus, purpose clauses are regularly expressed by the infinitive, most generally preceded by the preposition *pour,* as in older English, "He went *for* to see," etc.

The Auxiliary "to go."—The French reproduces the English use of the verb, "to go," as an auxiliary expressing intention or futurity, as in "I am going to do it." Thus, the verb *aller* is used as an auxiliary in expressing actions to be immediately performed: "I am coming at once" *Je vais venir;* "I was just going out," *J'allais sortir.*

The Auxiliary "to come."—On the other hand, the French has a construction lacking in English, in the use of the verb, *venir,* "to come," in expressing an act *just newly performed.* Thus: *Je viens de sortir,* "I have just come out." Just as *aller* in this use means "going to the to-do," so *venir* means, "coming from the to-do"—hence, "having done."

Uses of "devoir."—Several constructions besides those expressing direct obligation are expressed by the verb, *devoir.* Thus, intention and "social obligation" are so expressed, as *Il doit visiter chez nous,* "He intends to visit us"; *Nous devons aller au théâtre ce soir,* "We intend to go (or 'going') to the theatre this evening." *Devoir* also means "must," in the sense of

a contingent conclusion, as "You must be tired after so much work," *Vous devez las après tant de travaille.*

AUXILIARY USES OF "TO DO."—Although the verb, "to do," is not used as an auxiliary in the same way as in English, it appears in this use in many constructions rendered in English by "to have it done," "to make him do." Thus, *Nous ferons venir votre père,* "We shall send for ["make come"] your father." Also, *Je fais rebatir ma maison,* "I am building ["make to build"] my house." But, *Vous faites dire à moi une chose que je n'a jamais dit,* "You make [it appear] me to say a thing that I have never said."

IRREGULAR VERBS

In order to acquire even the rudiments of French conversation, the student must have a moderately clear idea of the irregularities in conjugation found in many of the verbs in most familiar use. The following list includes all the most notable irregularities, and should be carefully studied before attempting any very lengthy sentences.

The principal irregularities occur in the following tenses, which are designated by proper numbers in the appended list: (1) *present* and *past participles;* (2) *present indicative;* (3) *future indicative;* (4) *imperfect indicative;* (5) *preterit indicative;* (6) *present subjunctive.*

ABSOUDRE, *to absolve,* (1) absolvant, absous, absoute; (2) j'absous, tu absous, il absout, nous absolvons, vous absolvez, ils absolvent; (3) j'absoudrai; (4) j'absolvais; (6) que j'absolve.

ACQUÉRIR, *to acquire,* (1) acquérant, acquis, -e; (2) j'acquiers, tu acquiers, il acquiert, nous acquérons, vous acquérez, ils acquièrent; (3) j'acquerrai; (4) j'acquérais; (5) j'acquis; (6) que j'acquière.

ALLER, *to go,* (1) allant, allé, -e; (2) je vais, tu vas, il va, nous allons, vous allez, ils vont; (3) j'irai; (4) j'allais; (5) j'allai; (6) que j'aille, que nous allions, qu'ils aillent.

ASSAILLIR, *to assail,* (1) assaillant, assailli, -e; (2) j'assaille, tu assailles, il assaille, nous assaillons, vous assaillez, ils assaillent; (3) j'assaillirai; (4) j'assaillais; (5) j'assaillis; (6) que j'assaille.

ASSEOIR, *to seat,* (1) asseyant, assis, -e; (2) j'assieds; tu assieds, il assied, nous asseyons, vous asseyez, ils asseyent; (3) j'assiérai, *or* j'asseyerai; (4) j'asseyais; (5) j'assis; (6) que j'asseye.

BATTRE, *to beat.* All tenses regular except (2) je bats, tu bats, il bat.

BOIRE, *to drink,* (1) buvant, bu, -e; (2) je bois, tu bois, il boit, nous buvons, vous buvez, ils boivent; (3) je boirai; (4) je buvais; (5) je bus; (6) que je boive, que nous buvions, qu'ils boivent.

BOUILLIR, *to boil,* (1) bouillant, bouilli, -e; (2) je bous, tu bous, il bout, nous bouillons, vous bouillez, ils bouillent; (3) je bouillitai; (4) je bouillais; (5) je bouillis; (6) que je bouille.

CLORE, *to close,* (1) no *pres. part.,* clos, -e; (2) je clos, tu clos, il clot (no plural); (3) je clorai; (4-5 wanting); (6) que je close.

CONCLURE, *to conclude,* (1) concluant, conclu, -e; (2) je conclus, tu conclus, il conclut, nous concluons, vous concluez, ils concluent; (3) je conclurai; (4) je concluais; (5) je conclus; (6) que je conclue.

CONDUIRE, *to conduct,* (1) conduisant, conduit, -e; (2) je conduis, tu conduis, il conduit, nous conduisons, vous conduisez, ils conduisent; (3) je conduirai; (4) je conduisais; (5) je conduisis; (6) que je conduise.

CONFIRE, *to preserve,* (1) confisant, confit, -e. In all other parts like *suffire.*

CONNAÎTRE, *to know,* (1) connaissant, connu, -e; (2) je connais, tu connais, il connait, nous connaissons, vous connaissez, ils connaissent; (3) je connaîtrai; (4) je connaissais; (5) je connus; (6) que je connaisse.

CONSTRUIRE, *to construct,* is conjugated like *conduire.*

COUDRE, *to sew,* (1) cousant, consu, -e; (2) je couds, tu couds, il coud, nous cousons, vous cousez, ils cousent; (3) je coudrai; (4) je cousais; (5) je cousis; (6) que je couse.

COURIR, *to run,* (1) courant, couru; (2) je cours, tu cours, il court, nous courons, vous courez, ils courent; (3) je courrai; (4) je courais; (5) je courus; (6) que je coure.

CRAINDRE, *to fear,* (1) craignant, craint, -e; (2) je crains, tu crains, il craint, nous craignons, vous craignez, ils craignent; (3) je craindrai; (4) je craignais; (5) je craignis; (6) que je craigne.

CROIRE, *to believe,* (1) croyant, cru, -e; (2) je crois, tu crois, il croit, nous croyons, vous croyez, ils croient; (3) je croirai; (4) je croyais; (5) je crus; (6) que je croie, que nous croyions.

CROITRE, *to grow,* (1) croissant, crû, crue; (2) je crois, tu crois, il croit, nous croissons, vous croissez, ils croissent; (3) je croîtrai; (4) je croissais; (5) je crûs; (6) que je croisse.

CUEILLIR, *to gather,* (1) cueillant, cueilli, -e; (2) je cueille, tu cueilles, il cueille, nous cueillons, vous cueillez, ils cueillent; (3) je cueillerai; (4) je cueillais; (5) je cueillis; (6) que je cueille.

CUIRE, *to cook,* (1) cuisant, cuit, -e. The other tenses are conjugated like *conduire,* or it may be used in the infinitive with *faire* as an auxiliary.

DÉCHOIR, *to fall,* (1) *pres. part. wanting,* déchu, -e; (2) je déchois, tu déchois, il déchoit, nous déchoyons, vous déchoyez, ils déchoient; (3) je décherrai; (4) je déchoyais; (5) je déchus; (6) que je déchoie.

DEVOIR, *to owe* (must), (1) devant, dû, due; (2) je dois, tu dois, il doit, nous devons, vous devez, ils doivent; (3) je devrai; (4) je davis; (5) je dus; (6) que je doive, que nous devions.

DIRE, *to say,* (1) disant, dit, -e; (2) je dis, tu dis, il dit, nous disons, vous dites, ils disent; (3) je dirai; (4) je disais; (5) je dis; (6) que je dise.

DORMIR, *to sleep,* (1) dormant, dormi; (2) je dors, tu dors, il dort, nous dormons, vous dormez, ils dorment; (3) je dormirai; (4) je dormais; (5) je dormis; (6) que je dorme.

ÉCRIRE, *to write,* (1) écrivant, écrit, -e; (2) j'écris, tu écris, il écrit, nous écrivons, vous écrivez, ils écrivent; (3) j'écrirai; (4) j'écrivais; (5) j'écrivis; (6) que j'écrive.

ENVOYER, *to send,* (1) envoyant, envoyé, -e; (2) j'envoie, tu envoies, il envoie, nous envoyons, vous envoyez, ils envoient; (3) j'enverrai; (4) j'envoyais; (5) j'envoyai; (6) que j'envoie.

FAILLIR, *to fail,* (1) *pres. part. wanting,* failli; (2) il faut, ils faillent; (3) je faudrai; (5) je faillis.

FAIRE, *to do,* (1) faisant, fait, -e; (2) je fais, tu fais, il fait, nous faisons, vous faites, ils font; (3) je ferai; (4) je faisais; (5) je fis; (6) que je fasse.

FALLOIR, *to be necessary,* (1) *pres. part. wanting,* fallu; (2) il faut; (3) il faudra; (4) il fallait; (5) il fallut; (6) qu'il faille.

FUIR, *to flee,* (1) fuyant, fui. In the other tenses *i* becomes *y* before a vowel, except before *-e, -es, -ent.*

GESIR, *to lie,* (1) gisant; (2) il git, nous gisons, vous gisez, ils gisent; (4) je gisais.

JOINDRE, *to join,* (1) joignant, joint, -e. The other tenses are conjugated like *craindre,* substituting *oi* for *ai.*

LIRE, *to read,* (1) lisant, lu, -e; (2) je lis, tu lis, il lit, nous lisons, vous lisez, ils lisent; (3) je lirai; (4) je lisais; (5) je lus; (6) que je lise.

LUIRE, *to shine,* (1) luisant, lui. Other tenses are conjugated like *conduire,* except that the preterit is wanting.

METTRE, *to put,* (1) mettant, mis, -e; (2) je mets, tu mets, il met, nous mettons, vous mettez, ils mettent; (3) je mettrai; (4) je mettais; (5) je mis; (6) que je mette.

MOUDRE, *to grind,* (1) moulant, moulu, -e; (2) je mouds, tu mouds, il moud, nous moulons, vous moulez, ils moulent; (3) je moudrai; (4) je moulais; (5) je moulus; (6) que je moule.

MOURIR, *to die,* (1) mourant, mort, -e; (2) je meurs, tu meurs, il meurt, nous mourons, vous mourez, ils meurent; (3) je mourrai; (4) je mourais; (5) je mourus; (6) que je meure, que nous mourions, qu'ils meurent.

MOUVOIR, *to move,* (1) mouvant, mu, mue; (2) je meus, tu meus, il meut, nous mouvons, vous mouvez, ils meuvent; (3) je mouvrai; (4) je mouvais; (5) je mus; (6) que je meuve, que nous mouvions, qu'ils meuvent.

NAÎTRE, *to be born,* (1) naissant, né, -e. The other tenses are conjugated like *connaître,* except the preterit. (5) je naquis.

NUIRE, *to injure,* (1) nuisant, nui. This verb is conjugated like *conduire.*

OFFRIR, *to offer,* (1) offrant, offert, -e. This verb is conjugated like *ouvrir.*

OUÏR, *to hear,* (1) ouï, -e. This verb occurs only in the infinitive and the compound tenses.

OUVRIR, *to open,* (1) ouvrant, ouvert, -e; (2) j'ouvre, tu ouvres, il ouvre, nous ouvrons, vous ouvrez, ils ouvrent; (3) j'ouvrirai; (4) j'ouvrais; (5) j'ouvris; (6) que j'ouvre.

PAÎTRE, *to graze,* (1) paissant, no *past. part.* This verb is conjugated like *connaitre* in all tenses, but has no preterit.

PARTIR, *to set out,* (1) partant, parti, -e; (2) je pars, tu pars, il part, nous partons, vous partez, ils partent; (3) je partirai; (4) je partais; (5) je partis; (6) que je parte.

PEINDRE, *to paint,* (1) peignant, peint, -e. This verb is conjugated like *craindre,* substituting *ei* for *ai.*

PLAIRE, *to please,* (1) plaisant, plu; (2) je plais, tu plais, il plaît, nous plaisons, vous plaisez, ils plaisent; (3) je plairai; (4) je plaisais; (5) je plus; (6) que je plaise.

PLEUVOIR, *to rain,* (1) pleuvant, plu; (2) il pleut; (3) il pleuvra; (4) il pleuvait; (5) il plut; (6) qu'il pleuve.

POURVOIR, *to provide,* (1) pourvoyant, pourvu, -e; (2) je pourvois, tu pourvois, il pourvoit, nous pourvoyons, vous pourvoyez, ils pourvoient; (3) je pourvoirai; (4) je pourvoyais; (5) je pourvus; (6) que je pourvoie.

POUVOIR, *to be able,* (1) pouvant, pu; (2) je peux (puis), tu peux, il peut, nous pouvons, vous pouvez, ils peuvent; (3) je pourrai; (4) je pouvais; (5) je pus; (6) que je puisse.

PRENDRE, *to take,* (1) prenant, pris, -e; (2) je prends, tu prends, il prend, nous prenons, vous prenez, ils prennent; (3) je prendrai; (4) je prenais; (5) je pris; (6) que je prenne, que nous prenions, qu'ils prennent.

SE REPENTIR, *to repent,* (1) repentant, repenti, -e. Conjugated like *partir.*

RÉSOUDRE, *to resolve,* (1) résolvant, résolu, -e; (2) résous; je résous, tu résous, il résout, nous résolvons, vous résolvez, ils résolvent; (3) je résoudrai; (4) je résolvais; (5) je résolus; (6) que je résolve.

RIRE, *to laugh,* (1) riant, ri; (2) je ris, tu ris, il rit, nous rions, vous riez, ils rient; (3) je rirai; (4) je riais; (5) je ris; (6) que je rie.

ROMPRE, *to break,* (1) rompant, rompu, -e; (2) il rompt. All the rest of the verb is regular.

SAILLIR, *to project, to gush forth,* is conjugated like *assaillir.*

SAVOIR, *to know,* (1) sachant, su, -e; (2) je sais, tu sais, il sait, nous savons, vous savez, ils savent; (3) je saurai; (4) je savais; (5) je sus; (6) que je sache.

SENTIR, *to feel,* (1) sentant, senti, -e. This verb is conjugated like *partir.*

SERVIR, *to serve,* (1) servant, servi, -e; (2) je sers, tu sers, il sert, nous servons, vous servez, ils servent; (3) je servirai; (4) je servais; (5) je servis; (6) que je serve.

SORTIR, *to go out,* (1) sortant, sorti, -e. This verb is conjugated like *partir.*

SOUFFRIR, *to suffer,* (1) souffrant, souffert, -e. Other tenses conjugated like *ouvrir.*

SUFFIRE, *to suffice,* (1) suffisant, suffi; (2) je suffis, tu suffis, il suffit, nous suffisons, vous suffisez, ils suffisent; (3) je suffirai; (4) je suffisais; (5) je suffis; (6) que je suffise.

SUIVRE, *to follow,* (1) suivant, suivi, -e; (2) je suis, tu suis, il suit, nous suivons, vous suivez, ils suivent; (3) je suivrai; (4) je suivais; (5) je suivis; (6) que je suive.

TAIRE, *to keep silent,* (1) taisant, tu, -e. Conjugated like *plaire.*

TENIR, *to hold,* (1) tenant, tenu, -e; (2) je tiens, tu tiens, il tient, nous tenons, vous tenez, ils tiennent; (3) je tiendrai; (4) je tenais; (5) je tins; (6) que je tienne, que nous tenions, que vous teniez.

TRAIRE, *to milk,* (1) trayant, trait, -e; (2) je trais, tu trais, il trait, nous trayons, vous trayez, ils traient; (3) je trairai; (4) je trayais; no *preterit;* (6) que je traie, que nous trayions, que vous trayiez.

TRESSAILLIR, *to start,* (1) tressaillant, tressailli, -e. Is conjugated like *assaillir.*

VAINCRE, *to overcome,* (1) vainquant, vaincu, -e; (2) je vaincs, tu vaincs, il vainc, nous vainquons, vous vainquez, ils vainquent; (3) je vaincrai; (4) je vainquais; (5) je vainquis; (6) que je vainque.

VALOIR, *to be worth,* (1) valant, valu; (2) je vaux, tu vaux, il vaut, nous valons, vous valez, ils valent; (3) je vaudrai; (4) je valais; (5) je valus; (6) que je vaille, que nous valions, que vous valiez.

VENIR, *to come,* (1) venant, venu, -e. This verb is conjugated like *tenir.*

VÊTIR, *to clothe,* (1) vêtant, vêtu, -e; (2) je vêts, tu vêts, il vêt, nous vêtons, vous vêtez, ils vêtent; (3) je vêtirai; (4) je vêtais; (5) je vêtis; (6) que je vête.

VIVRE, *to live,* (1) vivant, vécu; (2) je vis, tu vis, il vit, nous vivons, vous vivez, ils vivent; (3) je vivrai; (4) je vivais; (5) je vécus; (6) que je vive.

VOIR, *to see,* (1) voyant, vu, -e; (2) je vois, tu vois, il voit, nous voyons, vous voyez, ils voient; (3) je verrai; (4) je voyais; (5) je vis; (6) que je voie, que nous voyions, que vous voyiez.

VOULOIR, *to be willing,* (1) voulant, voulu, -e; (2) je veux, tu veux, il veut, nous voulons, vous voulez, ils veulent; (3) je voudrai; (4) je voulais; (5) je voulus; (6) que je veuille, que nous voulions, que vous vouliez.

EASY EXPRESSIONS AND SHORT SENTENCES

FAMILIAR PHRASES

Tell me	*Dites-moi*
If you please	*S'il vous plaît*
Have the goodness	*Ayez la bonté*
Yes, Sir	*Oui, Monsieur*
Yes, Madam	*Oui, Madame*
Yes, Miss	*Oui, Mademoiselle*
No, Sir	*Non, Monsieur*
No, Madam	*Non, Madame*
No, Miss	*Non, Mademoiselle*
Will you tell me	*Voulez-vous me dire*
I thank you	*Je vous remercie*
Do you speak English? French?	*Parlez-vous anglais? français?*
I do not speak French	*Je ne parle pas français*
I speak it a little	*Je le parle un peu*
I understand	*Je comprends*
I do not understand	*Je ne comprends pas*
Do you understand?	*Comprenez-vous?*
Give me	*Donnez-moi*
some bread	*du pain*
some meat	*de la viande*
some wine	*du vin*
some beer	*de la bière*
Bring me	*Apportez-moi*
some coffee	*du café*
some tea	*du thé*
some milk	*du lait*
some butter	*du beurre*
some cheese	*du fromage*
Thank you	*Merci*

MEETING

Good-morning	*Bon jour*
How do you do?	*Comment vous portez-vous?*
Very well	*Très-bien*
I am very well	*Je me porte fort bien*
How is your father?	*Comment se porte Monsieur votre père?*
How is your mother?	*Comment se porte Madame votre mère?*
She is not well	*Elle ne se porte pas bien*
She is ill	*Elle est malade*
He is very ill	*Il est bien malade*
She has a cold	*Elle est enrhumée*
I must go	*Il faut partir*
Good-by	*Au plaisir*
Farewell	*Adieu*
Your servant	*Votre serviteur*
I wish you a good-morning	*Je vous souhaite le bon jour*
Good-evening	*Bon soir*
Good-night	*Bonne nuit*
I wish you good-night	*Je vous souhaite une bonne nuit*
My compliments to your father	*Saluez Monsieur votre père de ma part*
I will not fail	*Je n'y manquerai pas*

VISITS

There is a knock	*On frappe*
It is Mrs. B.	*C'est Madame B.*
I am very glad to see you	*Je suis charmé de vous voir*
Pray, be seated	*Asseyez-vous, je vous prie*
What news is there?	*Que dit-on de nouveau?*
Good news	*De bonnes nouvelles*
Do you believe it?	*Le croyez-vous?*
I believe it	*Je le crois*
I don't believe a word of it	*Je n'en crois pas un mot*
I think so	*Je crois que oui*
I think not	*Je cros que non*
Who told you?	*Qui vous l'a dit?*
It is no such thing	*Il n'en est rien*
Have you heard from home?	*Avez-vous reçu des nouvelles de chez-vous?*
The postman brought me a letter this morning	*Le facteur m'apporta une lettre ce matin*
They write sad news	*On m'écrit de mauvaises nouvelles*
Will you stay and dine with us?	*Voulez-vous rester à dîner avec nous?*
No, thank you	*Merci*
I can not stay	*Je ne peux pas restir*
I must go	*Il faut que je m'en aille*
You are in great hurry	*Vous êtes bien pressé*
I have a great deal to do	*J'ai bien des choses à faire*

EXPRESSIONS OF SURPRISE

What!	*Comment!*
Is it possible?	*Serait-il-possible?*
Who would have believed it!	*Qui l'aurait cru!*
Indeed	*En vérité*
It is impossible	*Cela est impossible*
That can not be	*Cela ne se peut pas*
I am astonished at it	*J'en suis bien étonné*

You surprise me	*Vous me surprenez*
It is incredible	*C'est incroyable*
It is unheard of	*Cela est inoui*
I am sorry for it	*J'en suis fâché*
I am quite vexed about it	*J'en suis désolé*
What a pity!	*Quel dommage!*
It is a great pity	*C'est bien dommage*
It is a sad thing	*Cela est bien fâcheux*
It is a great misfortune	*C'est un grand malheur*
I am very glad	*Je suis bien aise*
I am very glad of it	*J'en suis fort aise*
It gives me great joy	*J'en ai bien de la joie*
How happy I am	*Que je suis heureux*
I wish you joy	*Je vous félicite*
I congratulate you on it	*Je vous en fais mon compliment*

ANGER AND BLAME

He is very angry	*Il est bien en colère*
I am in a bad temper	*Je suis de mauvaise humeur*
She is furious about it	*Elle en est furieuse*
Hold your tongue	*Taisez-vous*
You are very wrong	*Vous avez bien tort*
What a shame!	*Quelle honte!*
How could you do so?	*Comment avez-vous pu faire cela?*
I am ashamed of you	*Vous me faites honte*
For shame!	*Fi donc!*
You are very much to blame	*Vous êtes bien à blâmer*
His patience is tired out	*La patience lui échappe*
Don't answer	*Ne répliquez pas*

AGE

How old are you?	*Quel âge avez-vous?*
I am twenty-two	*J'ai vingt-deux ans*
I shall soon be thirty	*J'ai bientôt trente ans*
He looks older	*Il paraît plus âgé*
I did not think you were so old	*Je ne vous croyais pas si âgé*
She is at least sixty	*Elle a au moins soixante ans*
How old is your uncle?	*Quel âgé peut avoir Monsieur votre oncle*
He is nearly eighty	*Il a à peu près quatre-vingt ans*
Is he so old?	*Est-il si âgé que cela?*
It is a great age	*C'est un grand âgé*
He begins to grow old	*Il commence à vieillir*

TO ASK QUESTIONS

What do you say?	*Que dites-vous?*
Do you hear me?	*M'entendez-vous?*
I don't speak to you	*Ce n'est pas à vous que je parle*
Do you understand me?	*Me comprenez-vous?*
Listen	*Ecoutez*
Come here	*Approchez—venez ici*
What is that?	*Qu'est-ce que cela?*
Why don't you answer?	*Pourquoi ne répondez-vous pas?*
What do you mean?	*Que voulez-vous dire?*
Don't you speak French?	*Ne parlez-vous pas français?*
Very little, sir	*Bien peu, Monsieur*
Do you know Mr. H.?	*Connaissez-vous Monsieur H.?*
I know him by sight	*Je le connais de vue*
I know him by name	*Je le connais de nom*
What do you call that?	*Comment appelez vous cela?*
What does that mean?	*Qu'est-ce que cela veut dire?*
What is that good for?	*A quoi cela est-il bon?*

MORNING

What o'clock is it?	*Quelle heure est-il?*
It is near eight	*Il est près de huit heures*
Light the fire	*Faites du feu*
I am going to get up	*Je vais me lever*
Get me some hot water	*Allez me chercher de l'eau chaude*
Make haste	*Ne soyez pas longtemps*
How have you slept?	*Comment avez-vous dormi?*
Did you sleep well?	*Avez-vous bien dormi?*
Very well, thank you	*Très-bien, je vous remercie*
Not very well	*Pas très-bien*
I never woke all night	*J'ai dormi tout d'un somme*
I could not sleep	*Je n'ai pas pu dormir*
I never closed my eyes	*Je n'ai pas fermé l'œil*
I have been up this hour	*Il y a une heure que je me suis levé*
You are an early riser	*Vous êtes matinal*
I generally rise early	*Je me lève ordinairement de bonne heure*

BREAKFAST

Breakfast is ready	*Le dejeûner est prêt*
Is breakfast ready?	*Le déjeûner est-il prêt?*
Come to breakfast	*Venez déjeûner*
Does the water boil?	*L'eau bout-elle*
This water has not boiled	*Cette eau n'a pas bouilli*

Is the tea made?	*Le thé est-il fait?*
Shall I put some green tea in the tea-pot?	*Mettrai-je du thé vert dans la théière?*
Very little	*N'en mettez que très-peu*
That is enough	*Cela est assez*
Some rolls	*Des petits pains*
Do you drink tea or coffee?	*Prenez-vous du thé ou du café?*
This cream is sour	*Cette crême s'est agrie*
Will you take an egg?	*Voulez-vous manger un œuf?*
These eggs are hard	*Ces œufs sont durs*
We want another egg-cup	*Il nous faut un autre coquetier*
Give me the salt	*Donnez-moi le sel*
Pass me the butter	*Passez-moi le beurre*
This butter is not fresh	*Ce beurre n'est pas frais*
Bring some more	*Allez-nous en chercher à autre*
Give me a spoon	*Donnez-moi une cuiller*
Is the coffee strong enough?	*Le café est-il assez fort?*
We want more cups	*Il nous manque des tasses*
Take some more sugar	*Prenez encore du sucre*
A piece of toast	*Une rôtie*
Cold meat	*De la viande froide*
The tablecloth	*La nappe*
The sugar basin	*Le sucrier*
Chocolate	*Du chocolat*
A knife	*Un couteau*
This knife is blunt	*Ce couteau ne coupe pas*
We have done breakfast	*Nous avons fini de déjeûner*
You can take away the things	*Vous pouvez desservir*

ORDERING DINNER

Have you ordered dinner?	*Avez-vous commandé le diner?*
Show me the bill of fare	*Montrez-moi la carte*
What soup will you have?	*Quelle soupe vous servirai-je?*
Macaroni soup	*De la soupe au macaroni*
Have you any roast-beef?	*avez-vous du bœuf rôti?*
Not to-day	*Pas aujourd'hui*
We have very fine fish	*Nous avons de très-bon poisson*
Fried soles	*Des soles frites*
A dozen of prawns	*Une douzaine de salicoques*
What wines will you have?	*Quel vins Monsieur désire-t-il?*
Let us see	*Voyons*
Have you the best wines?	*Avez-vous des vins fins?*
Here is the list	*En voici la liste*
We shall dine at six o'clock	*Nous dinerons à six heures*
Be punctual	*Soyez exacte*
What shall I help you to?	*Que vous servirai-je?*
Will you take some soup?	*Voulez-vous un peu de soupe?*
No, thank you	*Merci bien*
Willingly	*Très-volontiers*
Help yourself	*Servez-vous*
Well done, if you please	*Bien cuit, s'il vous plaît*
It is excellent	*Il est excellent*
Do you take pepper?	*Prenez-vous du poivre?*
Cayenne pepper	*Le poivre rouge*
Here are spinach and brocoli	*Voici des épinards et des brocolis*
Peas	*Des petits pois*
Cauliflower	*Du choufleur*
Artichokes	*Des artichauts*
Potatoes	*Des pommes de terre*
The mustard pot	*Le moutardier*
Change the plates	*Changez les assiettes*
Give me a clean fork	*Donnez-moi une fourchette propre*
Are you hungry?	*Avez-vous faim?*
I am hungry	*J'ai faim*
You don't eat	*Vous ne mangez pas*
Are you thirsty?	*Avez-vous soif?*
I am very thirsty	*J'ai bien soif*
I am dying of thirst	*Je meurs de soif*
Take a glass of wine	*Prenez un verre de vin*
Bring me a glass of water	*Apportez-moi un verre d'eau fraîche*
Give me something to drink	*Donnez-moi à boire*
This wine tastes of the cork	*Ce vin sent le bouchon*
It is flat	*Il est éventé*
A cork-screw	*Un tire-bouchon*

TEA

Tea is quite ready	*Le thé est tout prêt*
They are waiting for you	*On vous attend*
I am coming	*Me voici*
The tea is very strong	*Le thé est très-fort*
Pour out the tea	*Versez le thé*
Bring a saucer	*Apportez une soucoupe*
Where are the sugar-tongs?	*Où sont les pinces?*

Ring, if you please	*Sonnez, s'il vous plaît*
A little more milk	*Encore un peu de lait*
What will you take?	*Que prendrez-vous?*
A slice of bread and butter	*Une beurrée.—une tartine de beurre*
Hand the plate	*Passez l'assiette*
Will you take some cake?	*Voulez-vous du gâteau?*
A small piece	*Un petit morceau*
Make more toast	*Faites encore des rôties*
Make haste	*Depêchez-vous*
This is excellent tea	*Voilà d'excellent thé*
The tea-tray	*Le cabaret*
The milk-jug	*Le pot au lait*
A set of tea-things	*Un service*
Have you finished?	*Avez-vous déjà fini?*
Take another cup	*Prenez encore une tasse*
No, thank you	*Merci bien*
Brown bread	*Du pain bis*
White bread	*Du pain blanc*
Stale bread	*Du pain rassis*
New bread	*Du pain frais*

EVENING

It is late	*Il est tard*
It is not late	*Il n'est pas tard*
What o'clock is it?	*Quelle heure est-il?*
It is still early	*Il est encore de bonne heure*
Are you tired?	*Etes-vous fatigué?*
Not at all	*Point du tout*
Not much	*Pas beaucoup*
It is only ten	*Il n'est que dix heures*
It is time to go to bed	*Il est l'heure de se coucher*
Is my room ready?	*Ma chambre est-elle prêt?*
Go and see	*Allez-voir*
Draw the curtain	*Fermez cerideau*
A blanket	*Une couverture de laine*
I am sleepy	*J'ai sommeil*
Are you sleepy?	*Avez-vous sommeil?*
I wish you a good-night	*Je vous souhaite une bonne nuit*
Good-night	*Bon soir*



GERMAN SELF-TAUGHT

WHILE the German language belongs to the same family, or class, as the English, and the two have a very large number of their root-words in common, the English-speaking student will find his first and most serious difficulty in mastering its laws of syntax and in learning all the idioms required for even ordinary conversation. In respect to these two matters, he stands at an even greater disadvantage with German than with French. In a large number of cases an English sentence—words, order, and idioms—may be translated direct into French, and remain perfectly correct and comprehensible. To follow this practice very far with the German would involve the commission of grave errors, producing sentences either wholly meaningless or having quite contrary significance.

On the other hand, the German language is particularly easy of acquisition, on account of the uniformity of pronunciation, and on account of the simple construction of the verb. The gender of nouns is a source of perplexity to the average student, but by following the habit of learning the definite article in connection with each word memorized—thus: *der* Tag, *die* Stadt, *das* Haus—the matter may be very greatly simplified. In learning the proper use of verbal auxiliaries, particularly such as mean "ought," "should," "must," etc., the student must understand at the start that certain idiomatic usages in German prevent the direct translation of most English clauses; obliging him to commit to memory certain lists of expressions conveying the desired meanings. Indeed, apart from acquiring the rules of syntax, no better method of learning the language could be followed than memorizing idiomatic stanzas of poetry and prose sentences, in order to have a stock of model phrases at hand.

In regard to pronunciation, it may be stated that no such grave difficulties are involved but what careful attention to the rules herein given may result in intelligent mastery. As a matter of fact, the only real difficulties that confront the student lie in the fact that a few characteristic German sounds are not found in English.

THE ALPHABET AND PRONUNCIATIONS

THE GERMAN ALPHABET consists of the following 26 letters:

A, a; 𝔄, 𝔞, (ah).

Pronounced long, like *a* in "father"; short, like *o* in "hot."

B, b; 𝔅, 𝔟, (bay).

Pronounced as in English; final, like *p*.

C, c; ℭ, 𝔠, (tsay).

Pronounced hard, like *c* in "cure," if before *a, o, ö, u,* a consonant, or when final; like *ts* in "tsar," before *e, i, ä, ü.*

D, d; 𝔇, 𝔡, (day).

Pronounced as in English; final, like *t*.

E, e; 𝔈, 𝔢, (ay).

Pronounced as *a* in "nāme" when long; as *e* in "tĕll" when short; when final, almost like *e* in "bed," or like *ay* spoken rapidly.

F, f, ff; 𝔉, 𝔣, ffl, (ef).

Pronounced as in English.

G, g; 𝔊, 𝔤, (gay).

Pronounced as *g* in "go"; final, in *ig, gs, gt, gd, gst,* like the German *ch.*

H, h; ℌ, 𝔥, (hah).

Pronounced like *h* in "horse."

I, i; ℑ, 𝔦, (e).

Pronounced as *i* in "fit," when short; as *ee* in "meet," when long. The long sound of *i* is found principally in the diphthong *ie.*

J, j; 𝔍, 𝔧, (yot).

Pronounced as *y* in "yes."

K, k; 𝔎, 𝔨, (kah).

Pronounced as in English.

L, l; 𝔏, 𝔩, (el).

Pronounced as in English.

M, m; 𝔐, 𝔪, (em).

Pronounced as in English.

N, n; 𝔑, 𝔫, (en).

Pronounced as in English.

O, o; 𝔒, 𝔬, (o).

Pronounced as in English.

P, p; 𝔓, 𝔭, (pay).

Pronounced as in English

Q, q; 𝔔, 𝔮, (koo).

Pronounced like English *k*. *Qu* has the sound of *kw.*

R, r; ℜ, 𝔯, (err).

Pronounced as in English, only sounded distinctly, never slurred.

S, s; 𝔖, ſ, 𝔰, (es).

Pronounced as *s* in "sin"; like the English *z* at the beginning of a word.

T, t; 𝔗, 𝔱, (tay).

Pronounced as *t* in "table"; like *ts* before *i* followed by another vowel, as in *Nation* (nattseeyone).

U, u; 𝔘, 𝔲, (oo).

Pronounced as *oo* in "stool," when long; as *u* in "full" or "pull," when short.

V, v; 𝔙, 𝔳, (fow).

Pronounced as *f* in "far."

W, w; 𝔚, 𝔴, (vay).

Pronounced as *v* in "very."

X, x; 𝔛, 𝔵, (iks).

Pronounced as *x* in "fox."

Y, y; 𝔜, 𝔶, (ypsilon).

Pronounced as *y* in "system."

Z, z; ℨ, 𝔷, (tset).

Pronounced as *ts* in "fits."

Ordinary consonant combinations used in German type are as follows:

ch = *ch.* ß = *ss.*
ck = *ck.* tz = *ts.*

The form, ß, is used instead of ſſ, after long vowels, diphthongs, and at the end of words.

SHORT AND LONG VOWELS

The rule for shortening or lengthening the sound of a German vowel is practically the same as in English. A vowel is short before a double consonant (as *tt*) or two consonants (as *ld, nd*), and long, when doubled, or when followed by a single consonant or silent *h.*

The short sounds of the vowels, *i, e, u,* have been given above. The short sound of *o* is like the sound of *au* or *aw* in the English words, "naught," "taught," "paw," "saw." The English short *o,* as in "hot,"

"lot," etc., is more properly that of short *a* in German, as in *das Wasser*, "the water."

THE MODIFIED VOWELS

The three modified vowels, *ä, ö, ü*, written with the *Umlaut*, or two dots, like the English diaresis, represent combinations of the primary vowel sound with *e*.

The rule for identifying each of these sounds is the same as that given in connection with the French *u*.

In order to find the sound of *ä* (*æ*, or *"a-Umlaut"*), say long *a*, as in "father," then suddenly change to short *e*, as in "bed," and sound it, as nearly as possible, without changing the position of the lips. The resulting sound resembles short *e*, as in "men," pronounced with the lips much more open than is required by that sound.

The sound of *ö* (*œ*, or *"o-Umlaut"*) is found by similarly changing the sound of *o*, as in "boat," to *e*, as in "bet," without altering the position of the lips. The resulting sound closely resembles the French *eu*, or the English *u* in "fur," "but," "nut," pronounced with the lips arranged to say *"o."*

The sound of *ü* (*ue* or *"u-Umlaut"*) is found by arranging the lips to say *oo* as in "boot," and saying *e* as in "bet." The resulting sound resembles *e* in "bet," rather than *ee* in "beet," but retains an unmistakable suggestion of *u* that differentiates it from either.

Briefly described, the German modified vowels represent the effort to give two vowel sounds at once, and differ from diphthongal sounds in the fact that the voice does not automatically separate the two components, no matter how long the vocalization may be continued.

DIPHTHONGS

AI pronounced like *i* in "like," "mite," etc., only giving the *a*-sound more prominently.

AU, like *ow* in "cow," "how," "now."

ÄU or AEU, like *oi* in "loiter," or *oy* in "boy."

EI, *always* like *i* in "bite," "like," etc.

EU, like *oy* in "boy," "toy," etc.

IE (not properly a diphthong), *always* like the German long *i*, or the English *ee* in "beet," "meet," etc., except when in the last syllable of a word, when it is pronounced separately. Thus: *ien* is given like English *ee-en*.

If the student will always remember that *ei* and *ie* never interchange their respective sounds in any case, he will avoid a fertile source of perplexity to beginners in German. While *aeu* and *eu* represent sounds slightly different from the English *oi* or *oy*, the equivalents given above are sufficiently close for practical purposes.

DOUBLE CONSONANTS

Since the proper sounds of the consonants have already been given, it remains only to note a few sounds proper to German in consonant combinations.

CH is a sound peculiar to German, and without a close correspondent in English. The sound is either palatal, with the vowel *i*, or guttural, with the vowel *a*. The palatal sound, as in the first personal pronoun, *ich*, is given by some foreigners as "ik," by others as "ish." The true sound is between the two. To identify it, the student should pronounce the sound "ik" several times, until the position of the vocal organs, particularly the tongue and lips, is thoroughly understood. Then, let him try to say "ish" without altering the position of the lips at all, or of the tongue any more than possible. The result is short *i* followed by a rough breathing resembling the sound made by one attempting to imitate the "spitting" of a cat. The sound of guttural *ch* after *a* is the same rough breathing made as far back in the mouth as possible without "gurgling" in the throat. It is, in fact, a compromise between hard *ch*, as in "much," and "k." At the beginning of a word, *ch* has about the sound of *k*. Followed by *s*, it has the sound of *x*.

PF has the sound of both letters made with compressed lips.

TH has the sound of *t*, the *h* being silent. It is never given like the English *th*, which is a sound very difficult to Germans.

SCH has the sound of *sh*, as in the English words, "ship," "sheep," etc.

TZ is written for *zz*, and has the same sound of *ts*. It occurs only after vowels.

Such consonantal combinations as *ck* and *ph* have the same values as in English.

In consonant combinations, such as *kn* and *gn*, at the beginning of words both letters are sounded fully, somewhat as if a very short *e* or *i* sound were between them. Thus the word *knabe* is pronounced *"k'nahbeh,"* the almost imperceptible vowel being represented by the apostrophe.

DT at the end of a word is sounded like *tt* in English.

RULES OF ACCENT

REGULAR ACCENT.—The accent in German words *regularly* falls on the root-syllable, or that syllable which gives the meaning to the word. Thus, we have *lieb* from the word *lieben*, "to love," in the following, always taking the accent:

Ge*liebt*, ver*liebt*, *Lieb*ling, *lieb*lich, *Lieb*lichkeit.

IN COMPOUND NOUNS and adjectives the accent falls on the first, as in *Regen*schirm, *Gast*haus, *Schaff*skopf, *Früh*stück, *see*krank.

IN COMPOUND PARTICLES the accent falls on the second member. Thus: da*mit*, da*von*, viel*leicht*.

WORDS BORROWED FROM OTHER LANGUAGES, particularly French, take the accent on the last syllable as in Fig*ur*, Pal*ast*, Sol*dat*, Plan*et*.

VOCABULARY OF FAMILIAR AND USEFUL WORDS

PRONUNCIATION.—In the following vocabulary the pronunciation of words is given, as far as possible, in the English equivalent sounds. Where these do not exist, as in the modified vowels, *ä*, *ö*, *ü*, the vowels are given in italics; so, also, with the German *ch* sound. Wherever these occur, therefore, the student may learn the proper pronunciation by consulting the foregoing discussion of the alphabet.

In the case of long sounds of *a* and *o*, the combinations "ah" and "oh" are always given; the pronunciation being the same as in the English interjections spelled in these ways. Long *i* sound, as the equivalent of the German diphthong *ei*, is given as *y* or as *i* followed by silent *e* after a consonant. Thus: *ein* is given *"ine."*

The student should remember that the final *e* in German words, while given as *ay*, pronounced as in "hay," "may," etc., is somewhat shorter, as *ai* in "bait."

THE ARTICLE.—Since every German noun has a gender, whether it represent natural sex or not, it will be necessary for the student to understand the significance of the definite article placed before it. The article has three genders—masculine, feminine, and neuter. Thus:

Masculine	Feminine	Neuter
der (dair)	*die* (dee)	*das* (dos)

Every German substantive is written with a capital letter.

NOUNS INDICATING PARTS OF THE EARTH

English	German	Pronunciation
The earth	die Erde	dee airday
the fire	das Feuer	dos foyer
the water	das Wasser	dos vosser
the rainwater	das Regen-wasser	dos raygen-vosser
the stream	der Strom	dair strome
the sea	die See	dee say
the weather	das Wetter	dos vetter
the summer	der Sommer	dair sommer
the winter	der Winter	dair vinter
the summer weather	das Sommer-wetter	dos sommer-vetter
the winter weather	das Winter-wetter	dos vinter vetter
the wind	der Wind	dair vint
the rain	der Regen	dair regen
the storm	der Sturm	dair stoorm
the hail	der Hagel	dair hahgel
the frost	der Frost	dair frosst
the snow	der Schnee	dair shnay
the ice	das Eis	dos ice
the thunder	der Donner	dair dohnner
the morning	der Morgen	dair morgen
the day	der Tag	dair tahg
the midday	der Mittag	dair mittahg
the night	die Nacht	dee na*ch*t
the moon	der Mond	dair mohnt
the sun	die Sonne	dee sonneh
the star	der Stern	dair stairn
the light	das Licht	dos li*ch*t
the year	das Jahr	dos yahr

THE WORLD AND ITS ELEMENTS

God	Gott	got
the Creator	der Schöpfer	dair shopfer
Nature	die Natur	dee natoor
the sky	der Himmel	dair himmel
the world	die Welt	dee velt
the air	die Luft	dee looft
the cloud	die Wolke	dee volkay
the storm	das Gewitter	dos gevitter
the lightning	der Blitz	dair blitz
the rainbow	der Regen-bogen	dair raygen-bogen
the fog	der Nebel	dair naybel
the river	der Fluss	dair floos
the brook	der Bach	dair ba*ch*
the lake	der See	dair zay
the sea	das Meer	dos mare
the tide	die Fluth	dee floot
the ebb	die Ebbe	dee ebbay
the shore	das Ufer	dos oofer
the mountain	der Berg	dair bairg
the meadow	die Wiese	dee veesay
the forest	der Wald	dair vollt

THE HUMAN BODY

English	German	Pronunciation
The body	der Körper	dair *k*orper
the skin	die Haut	dee hout
the face	das Gesicht	dos gesi*ch*t
the head	der Kopf	dair kopf
the forehead	die Stirn	dee steern
the tongue	die Zunge	dee tsoong-*ay*
the tooth	der Zahn	dair zaan
the arm	der Arm	dair arm
the beard	der Bart	dair bart
the blood	das Blut	dos bloot
the bosom	der Busen	dair boosen
the breast (chest)	die Brust	dee broost
the eye	das Auge	dos owgay
the ear	das Ohr	dos ore
the chin	das Kinn	dos kin
the eyebrows	die Augenbrauen	dee owgenbrowen
the elbows	der Elbogen	dair elbogen
the fist	die Faust	dee fowst
the finger	der Finger	dair fing-er
the flesh	das Fleisch	dos flysh
the foot	der Fuss	dair foos
the hair	das Haar	dos har
the hand	die Hand	dee hont
the right hand	die rechte Hand	dee rechtay hont
the left hand	die linke Hand	dee linkay hont
the heart	das Herz	dos hairtz
the hip	die Hüfte	dee h*ü*fte
the knee	das Knie	dos k'nee
the lip	die Lippe	dee lippay
the underlip	die Unterlippe	dee oonterlippay
the upperlip	die Oberlippe	dee oberlippay
the neck	der Nacken	dair nacken
the nose	die Nase	dee nazay
the mouth	der Mund	dair moont
the stomach	der Magen	dair mahgen
the voice	die Stimme	dee stimmay
the hearing	das Gehör	dos geh*o*r
the sight	der Sicht	dair si*ch*t
the taste	der Geschmack	dair geshmack
the feeling	das Gefühl	dos gef*ü*hl
the smell	der Geruch	dair gerooc*h*
the neck	der Hals	dair hals
the back	der Rücken	dair r*ü*cken
the leg	das Bein	dos bine

NUTRIMENTS

The meal	die Mahlzeit	dee mahl-tsite
breakfast	das Frühstück	dos fr*ü*-st*ü*ck
dinner	das Mittagessen	dos mittahgessen
the refreshment	die Erfrischung	dee erfrischoong
supper	das Abendbrod	dos abentbrote
boiled meat	gekochtes Fleisch	gekochtes flishe
roast meat	Braten	brahten
beef	Rindsfleisch	rindsflishe
roast-beef	Rinderbraten	rinderbrahten
veal	Kalbfleisch	kalbflishe
calves-liver	Kalbsleber	kalbs-layber
veal-cutlets	Kalbscoteletten	kalbs-cotteletten
mutton	Hammelfleisch	hamelflishe
a leg of mutton	eine Hammelskeule	inay hamelskoylay
pork	Schweinefleisch	shvinayflishe
ham	Schinken	shinken
bacon	Speck	speck
a sausage	eine Wurst	inay voorst
vegetables	Gemüse	gem*ü*say
a pie	eine Pastete	inay pastatay
an omelet	eine Eierkuchen	inay eyerkooc*h*en
cake	Kuchen	kooc*h*en
cheese	der Käse	c*ä*say
eggs	Eier	eyer
Hock	Rheinwein	rhinevine
Port-wine	Portwein	portvine
Sherry	Xereswein	kseress*v*ine
the beer	das Bier	dos beer
the glass	das Glas	dos glahs
the flask	die Flasche	dee flashay
the bread	das Brod	dos brote
fresh bread	frisches Brod	frishes brote
the butter	die Butter	dee bootter
fresh butter	frische Butter	frishay bootter
the honey	der Honig	dair honizh
the milk	die Milch	dee mil*ch*
the buttermilk	die Buttermilch	dee bootter-mil*ch*
the oil	das Oel	dos *o*l
the fish	der Fisch	dair fish
the punch	der Punsch	dair poonch
the water	das Wasser	dos vosser
the salt	das Salz	dos saltz
the pepper	der Pfeffer	dair pfeffer
the salad	der Salat	dair salat
the soup	die Suppe	dee sooppay
the pudding	der Pudding	dair poodding
the coffee	der Kaffee	dair kaffay
the tea	der Thee	dair tay
the chocolate	die Chokolade	dee chocolahday
the lemonade	die Limonade	dee limonahday

EATING UTENSILS

The eating	das Essen	dos essen
the drinking	das Trinken	dos trinken
the tablecloth	das Tischtuch	dos tischtooc*h*

English	German	Pronunciation
the napkin	die Serviette	dee serviettay
the plate	der Teller	dair teller
the knife	das Messer	dos messer
the fork	die Gabel	dee gahbel
the spoon	der Löffel	dair luffel
the vinegar	der Essig	dair essizh
the mustard	der Senf	dair zenf
the cup	die Tasse	dee tassay
the dish	die Schüssel	dee shussel

THE DRESS

The clothes	die Kleider	dee klider
the coat	der Rock	dair rohck
the trousers	die Hosen	dee hozen
the pocket	die Tasche	dee tashay
the buttons	die Knöpfe	dee knopfay
the dressing-gown	der Schlafrock	dair shlafrock
the slippers	die Pantoffeln	dee pantofeln
the drawers	die Unterhosen	dee oonter-hosen
the stockings	die Strümpfe	dee strumpfay
the shirt	das Hemd	dos hemt
the braces	die Hosen-träger	dee hozen-trayger
the waistcoat	die Weste	dee vestay
the boot	der Stiefel	dair steefel
the bootjack	der Stiefel-knecht	dair steefel-knecht
the cap	die Mütze	dee mutzay
the gloves	die Hand-schuhe	dee hont-shooay
the handkerchief	das Taschen-tuch	dos tashen-tooch
the watch	die Uhr	dee oor
the umbrella	der Regen-schirm	dair raygen-sheerm
the purse	die Börse	dee borsay
the brush	die Bürste	dee burstay
the comb	der Kamm	dair komm
the apron	die Schürze	dee shurtzay
the fan	der Fächer	dair facher
the dress	das Kleid	dos klide
the petticoat	der Unterrock	dair oonter-rohck
the stays	der Schnürleib	dair shnurlibe
the veil	der Schleier	dair shlier
the powder	der Puder	dair pooder
the soap	die Seife	dee zifay
the tooth-powder	das Zahnpulver	dos tzonpool-ver
the jacket	die Jacke	dee yackay
the shoe	der Schuh	dair shoe
the hat	der Hut	dair hoot
the hairbrush	die Haarbürste	dee hahrburs-tay
the frock (coat)	der Frack	dair frak
the wool	die Wolle	dee vollay
the stick	der Stock	dair stohck
the cravat	die Cravatte	dee cravatay
the cap	die Kappe	dee kappay
the ring	der Ring	dair ring

RELATIONS

The woman	die Frau	dee frow
the boy	der Knabe	dair knahbay
the girl	das Mädchen	dos madchen
the child	das Kind	dos kint
the old man	der Greis	dair grice
the parents	die Eltern	dee eltern
the father-in-law	der Schwieger-vater	dair shveegayr-fater
the mother-in-law	die Schwieger-mutter	dee schvee-gayrmootter
the brother-in-law	der Schwager	dair shvahger
the cousin	der Vetter	dair fetter
the marriage	die Heirath	dee hi-raht
the wedding	die Hochzeit	dee hohchtzite
the father	der Vater	dair fater
the grandfather	der Grossvater	dair grosfater
the stepfather	der Stiefvater	dair steeffater
the fatherland	das Vaterland	dos faterlont
the mother	die Mutter	dee mootter
the brother	der Bruder	dair brooder
the sister	die Schwester	dee shvester
the uncle	der Onkel	dair onkel
the aunt	die Tante	dee tantay
the nephew	der Neffe	dair neffay
the niece	die Nichte	dee nichtay
the man	der Mann	dair mon
the bride	die Braut	dee browt
the widow	die Wittwe	dee vitvay
the widower	der Wittwer	dair vitver
the guest	der Gast	dair gast
the neighbor	der Nachbar	dair nachbar
the friend	der Freund	der froint

TOWN AND COUNTRY, HOUSE AND GARDEN

The house	das Haus	dos house
the garden	der Garten	dair garten
the land	das Land	dos lont
the market	der Markt	dair markt
the street	die Strasse	dee strassay
the church	die Kirche	dee keerchay
the bank	die Bank	dee bahnk
the theatre	das Theater	dos tayahter
the hospital	das Hospital	dos hospital
the coffee-house	das Kaffee-haus	dos kaffay-house
the palace	der Palast	dair palast
the haven (harbor)	der Hafen	dair hafen
the door	die Thür	dee tur

English	German	Pronunciation
the bed	das Bett	dos bet
the mattress	die Matratze	dee matratzay
the oven	der Ofen	dair ofen
the beerglass	das Bierglas	dos beerglahs
the wineglass	das Weinglas	dos vineglahs
the stool (chair)	der Stuhl	dair stool
the field	das Feld	dos felt
the dale (valley)	das Thal	dos tahl
the wood (forest)	der Wald	dair vahlt
the bush	der Busch	dair boosh
the heath	die Haide	dee hiday
the hill	der Hügel	dair hügel
the corn	das Korn	dos korn
the straw	das Stroh	dos shtro

THE PROFESSIONS AND TRADE

The baker	der Bäcker	dair becker
the bookbinder	der Buchbinder	dair boo*ch*binder
the book	das Buch	dos boo*ch*
the doctor	der Doktor	dair doktohr
the hat	der Hut	dair hoot
the hatter	der Hutmacher	dair hootmah*ch*er
the shoe	der Schuh	dair shoe
the shoemaker	der Schuhmacher	dair shoemah*ch*er
the beard	der Bart	dair bart
the barber	der Barbier	dair barbeer
the glass	das Glas	dos glahs
the glazier	der Glaser	dair glahser
the nail	der Nagel	dair nahgel
the saddle	der Sattel	dair sattel
the saddler	der Sattler	dair sattler
the mill	die Mühle	dee m*ü*lay
the miller	der Müller	dair m*ü*ller
the master	der Meister	dair miceter
dancing	tanzen	tantzen
the dancing-master	der Tanzmeister	dair tantzmiceter
the post	die Post	dee post
the post-master	der Postmeister	dair postmiceter
the riding-master	der Reitmeister	dair ritemiceter
the school	die Schule	dee shoolay
the school-master	der Schulmeister	dair shoolmiceter
the smith	der Schmid	dair shmit
the smithy	die Schmiede	dee shmeeday
the nailsmith (nailmaker)	der Nagelschmid	dair nagelshmit
the goldsmith	der Goldschmid	dair goltshmit
the coppersmith	der Kupferschmid	dair koopfershmit
the weaver	der Weber	dair vayber
the king	der König	dair konizh
the prince	der Prinz	dair prints
the baron	der Baron	dair baron
the officer	der Officier	dair offitseer
the soldier	der Soldat	dair soldat
the pope	der Papst	dair papst
the archbishop	der Erzbischof	dair ertzbishoff
the bishop	der Bischof	dair bishoff

THE QUADRUPEDS

The hound (dog)	der Hund	dair hoont
the cat	die Katze	dee katzay
the rat	die Ratte	dee rattay
the mouse	die Maus	dee mouse
the swine (pig)	das Schwein	dos shvine
the hare	der Hase	dair hahzay
the roe	das Reh	dos ray
the ox	der Ochse	dair ocksay
the bull	der Bulle	dair boollay
the cow	die Kuh	dee koo
the calf	das Kalb	dos kalb
the sheep	das Schaf	dos shaf
the lamb	das Lamm	dos lom
the fox	der Fuchs	dair fooks
the wolf	der Wolf	dair volf
the bear	der Bär	dair bear
the elephant	der Elephant	dair elefahnt
the camel	das Kameel	dos camale
the horse	das Pferd	dos pfayrd
the colt	das Füllen	dos feeyullen
the donkey	der Esel	dair aysel
the goat	die Ziege	dee tzeegay
the dog	der Hund	dair hoont
the pig	das Schwein	dos shvine

BIRDS, FISHES, AND INSECTS

The swan	der Schwan	dair shvahn
the falcon	der Falke	dair folkay
the goose	die Gans	dee gans
the stork	der Storch	dair stor*ch*
the snipe	die Schnepfe	dee shnepfay
the raven	der Rabe	dair rahbay
the lark	die Lerche	dee ler*ch*ay
the nightingale	die Nachtigal	dee na*ch*tigal
the cuckoo	der Kuckuck	dair kookook
the swallow	die Schwalbe	dee shvolbay
the finch	der Finke	dair finkay
the sparrow	der Sperling	dair sperling
the fish	der Fisch	dair fish
the carp	der Karpfen	dair carpfen
the herring	der Hering	dair hering
the eel	der Aal	dair ahl
the frog	der Frosch	dair frosh
the worm	der Wurm	dair voorm
the spider	die Spinne	dee spinnay
the oyster	die Auster	dee owster

English	German	Pronunciation
the crab	der Krebs	dair kreps
the flea	der Floh	dair flo
the fly	die Fliege	dee fleegay
the bee	die Biene	dee beenay
the wasp	die Wespe	dee vespay
the snail	die Schnecke	dee shneckay
the duck	die Ente	dee entay
the pigeon	die Taube	dee towbay
the cock	der Hahn	dair hahn
the chicken	das Hühnchen	dos hu*nch*en
the eagle	der Adler	dair ahdler
the hawk	der Habicht	dair habi*cht*
the pheasant	der Fasan	dair fahsan
the bat	die Fleder-maus	dee flayder-mouse
the partridge	das Rebhuhn	dos rebhoon
the peacock	der Pfau	dair pfow
the lobster	der Hummer	dair hoommer
the pike	der Hecht	dair he*cht*
the perch	der Barsch	dair barsh
the salmon	der Lachs	dair locks
the trout	die Forelle	dee forellay
the snake	die Schlange	dee shlongay
the ant	die Ameise	dee ah-my-say
the butterfly	der Schmetter-ling	dair shmetter-ling

TRAVELLING

The voyage	die Seereise	dee zayreyzay
the traveller	der Reisende	dair reyzenday
the road	die Land-strasse	dee lontstras-say
the railroad	die Eisenbahn	dee isenbahn
the station	die Station	dee statzione
the train	der Zug	dair tzoog
the engine	die Maschine	dee masheenay
the carriage	der Wagen	dair vahgen
the departure	die Abreise	dee ah-bry-say
the arrival	die Ankunft	dee onkoonft
the passport	der Pass	dair pass
the inn (hotel)	der Gasthof	dair gasthof
the landlord	der Wirth	dair veert
the waiter	der Kellner	dair kelner
the bill	die Rechnung	dee re*ch*noong
the interpreter	der Dolmet-scher	dair dolmet-sher
the luggage	das Gepäck	dos gepeck
the trunk	der Koffer	dair coffer
the carpet-bag	der Reisesack	dair rey-zay-sock

MINERALS AND METALS, ETC.

The gold	das Gold	dos golt
the silver	das Silber	dos silber
the copper	das Kupfer	dos koopfer
the iron	das Eisen	dos izen
the tin	das Zinn	dos tsinn
the steel	der Stahl	dair stahl
the zinc	das Zink	dos tsink
the bronze	die Bronze	dee brontsay
the diamond	der Diamant	dair deeamont
the pearl	die Perle	dee pairlay
the coral	die Koralle	dee corallay
the marble	der Marmor	dair marmor
the gypsum	der Gyps	dair gips
the lime (clay)	der Lehm	dair lame
the chalk	der Kalk	dair calk
the coal	die Kohle	die coalay
the earth	die Erde	dee airday
the sand	der Sand	dair sont
the stone	der Stein	dair stine

SHIPS AND SHIPPING

The ship	das Schiff	dos shiff
the boat	das Boot	dos boat
the ship of the line	das Linien-schiff	dos leenee-enshiff
the fisherboat	das Fischer-boot	dos fisherboat
the anchor	der Anker	dair onker
the deck	das Deck	dos deck
the flag	die Flagge	dee flaggay
the mast	der Mast	dair mast
the foremast	der Vorder-mast	dair forder-mast
the sail	das Segel	dos saygel
the strand	der Strand	dair strant
the rudder	das Ruder	dos rooder
the net	das Netz	dos netz
the lading (freight)	die Ladung	dee ladung
the freight	die Fracht	dee fra*cht*
the cliff	die Klippe	dee klippay
the downs	die Dünen	dee d*u*nen
the haven	der Hafen	dair hafen
the ground	der Grund	dair groont
the storm	der Sturm	dair stoorm
the fleet	die Flotte	dee flottay
the frigate	die Fregatte	dee fregatay

OF WRITING

The paper	das Papier	dos papeer
the writing-paper	das Schreib-papier	dos shribe-papeer
the writing	die Schrift	dee shrift
the sheet	der Bogen	dair bogen
the pen	die Feder	dee fayder
the steel pen	die Stahl-feder	dee stahlfay-der
the penknife	das Federmes-ser	dos faydermes-ser
the inkstand	das tintenfass	dos tintenfoss
the ink	die Tinte	dee tintay
the pencil	der Bleistift	dair blystift
the scissors	die Scheere	dee shayray
the seal	das Petschaft	dos petshaft
the sealing-wax	der Siegellack	dair seegellack

English	German	Pronunciation
the wafer	die Oblate	dee oblahtay
the ruler	das Lineal	dos leenayal
the letter	der Brief	dair breef
the note	das Billet	dos bilyet
the envelope	das Couvert	dos coovayrt
the date	das Datum	dos datoom
the direction	die Adresse	dee adressay
	THE SEA	
The Ocean	der Ocean	dair oatsayan
the Baltic	die Ostsee	dee ostsay
the North-Sea	die Nordsee	dee nordsay
the channel	der Kanal	dair canal
the island	die Insel	dee insel
the shore	die Küste	dee kustay
the waves	die Wellen	dee vellen
the tide	die Fluth	dee floot
the rock	der Fels	dair fels
the beach	die Seeküste	dee saykustay
the navy	die Marine	dee mareenay
the vessel	das Schiff	dos shiff
the steamer	das Dampf-boot	dos dampf-boat
the man-of-war	das Kriegs-schiff	dos kreegs-shiff
the merchant vessel	der Kauffahrer	dair kowffahrer
the rudder	das Ruder	dos rooder
the rigging	das Takelwerk	dos tackleverk
the cabin	die Kajüte	dee ka-yutay
the stern	das Hintertheil	dos hintertile
the bow	der Bug	dair boog
the maintop	der Mastkorb	dair mastkorb
the oar	das Ruder	dos rooder
the rope	das Tau	dos tow
the captain	der Kapitän	dair capitan
the boatswain	der Bootsmann	dair boatsmon
the sailor	der Matrose	dair matrosay
the cabin-boy	der Schiffsjunge	dair schiffsyungay
the pilot	der Lootse	dair loatsay
the light-house	der Leuchtthurm	dair loychttoorm
the harbor	der Hafen	dair hafen
	TIME AND SEASONS	
A century	ein Jahrhundert	ine yar-hoondert
the year	das Jahr	dos yar
the month	der Monat	dair monot
the week	die Woche	dee vochay
the day	der Tag	dair tahg
the hour	die Stunde	dee stoonday
the minute	die Minute	dee minutay
the second	die Sekunde	dee secoonday
the seasons	die Jahreszeiten	dee yareszitten

English	German	Pronunciation
spring	Frühling	fruling
summer	Sommer	sommer
autumn	Herbst	hairbst
winter	Winter	vinter
January	Januar	yanooar
February	Februar	febrooar
March	März	marts
April	April	apreel
May	Mai	my
June	Juni	yoonee
July	Juli	yoolee
August	August	owgoost
September	September	september
October	October	october
November	November	november
December	December	detzember
the days of the week	die Wochentage	dee vochentahgay
Sunday	Sonntag	sontahg
Monday	Montag	monetahg
Tuesday	Dienstag	deenstahg
Wednesday	Mittwoch	mittvoch
Thursday	Donnerstag	donnerstahg
Friday	Freitag	fritahg
Saturday	Sonnabend	sonabent
a holiday	ein Feiertag	ine firetahg
Christmas	Weihnachten	vine-ahchten
Easter	Ostern	ostern
Whitsuntide	Pfingsten	p'fingsten
the morning	der Morgen	dair morgen
noon	Mittag	mittahg
the afternoon	der Nachmittag	dair nachmittahg
the evening	der Abend	dair ahbent
the night	die Nacht	dee nacht
midnight	Mitternacht	mitternacht
sunrise	Sonnenaufgang	sonnenowfgong
sunset	Sonnenuntergang	sonnenoontergong
	THE TOWN	
The city	die Stadt	dee stott
the suburb	die Vorstadt	dee forstott
the gates	die Thore	dee toray
the edifice	das Gebäude	dos geboiday
the tower	der Thurm	dair toorm
the cathedral	der Dom	dair dome
the church-yard	der Kirchhof	dair keerchhof
the town hall	das Rathhaus	dos rahthouse
the arsenal	das Zeughaus	dos zoyghouse
the mint	die Münze	dee muntzay
the custom-house	das Zollhaus	dos zollhouse
the library	die Bibliothek	dee bibleeotake
the university	die Universität	dee ooniversitate
the exchange	die Börse	dee borsay

English	German	Pronunciation
the prison	das Gefängniss	dos ge*f*ang-niss
the square	der Platz	dair platz
the lane	die Gasse	dee gassay
the bridge	die Brücke	dee br*u*ckay
the monument	das Monument	dos monoo-ment
the dining-room	das Speisehaus	dos spysay-house
the shop	der Laden	dair lahden

THE HOUSE

The bell	die Glocke	dee glockay
the knocker	der Klopfer	dair klopfer
to open	öffnen	*o*fnen
the servant	die Magd	dee magt
the staircase	die Treppe	dee treppay
the room	das Zimmer	dos tzimmer
the drawing-room	das Putzzimmer	dos pootztzimmer
the sitting-room	das Wohnzimmer	dos vohntzimmer
the dining-room	das Esszimmer	dos ess-tzimmer
the sleeping-room	das Schlafzimmer	dos shlaftzimmer
the kitchen	die Küche	dee k*u*chay
the cellar	der Keller	dair keeler
the window	das Fenster	dos fenster
the stove	der Ofen	dair ohfen
the chimney	der Kamin	dair kameen
the looking-glass	der Spiegel	dair speegel
the table	der Tisch	dair tish
the chair	der Stuhl	dair stool
the armchair	der Armstuhl	dair armstool
the carpet	der Teppich	dair teppi*ch*
the chest of drawers	die Kommode	dee commoh-day
the sofa	der Sopha	dair sofa
the candlestick	der Leuchter	dair loy*ch*ter
the candle	das Licht	dos li*ch*t
the lamp	die Lampe	dee lompay
the wick	der Docht	dair do*ch*t
the oil	das Oel	dos *o*l
to light	anzünden	anz*u*nden
the bed	das Bett	dos bet
the counter-pane	die Bettdecke	dee bettdeckay
the sheets	die Bettücher	dee bett*u*cher
the pillow	das kopfkissen	dos kopfkissen
the basin	das waschbecken	dos vashbecken
the soap	die Seife	dee sifay
the towel	das Handtuch	dos hondtooch
warm water	warmes Wasser	varmes vasser
cold water	kaltes Wasser	kaltes vasser
hot water	heisses Wasser	heyses vasser
to wash	waschen	vashen

FRUITS, TREES, AND FLOWERS

English	German	Pronunciation
the apple	der Apfel	dair opfel
the apple-tree	der Apfelbaum	dair opfelbowm
the pear	die Birne	dee beernay
the pear-tree	der Birnbaum	dair beern-bowm
the plum	die Pflaume	dee pflowmay
the plum-tree	der Pflaumenbaum	dair pflowmen-bowm
the cherry	die Kirsche	dee keershay
the chestnut	die Kastanie	dee kostonee
the peach	der Pfirsich	dair pfeersi*ch*
the apricot	die Apricose	dee apreecosay
the orange	die Apfelsine	dee apfelseenay
the lemon	die Citrone	dee citronay
the grape	die Weintraube	dee vine-trow-bay
the nut	die Nuss	dee nooss
the walnut	die Wallnuss	dee volnooss
the currant	die Johannisbeere	dee yohanis-bayray
the gooseberry	die Stachelbeere	dee stachel-bayray
the raspberry	die Himbeere	dee himbayray
the blackberry	die Brombeere	dee brombay-ray
the strawberry	die Erdbeere	dee erdbayray
the oak	die Eiche	dee i-*ch*ay
the beech	die Buche	dee boo*ch*ay
the poplar	die Pappel	dee pohpel
the lime	die Linde	dee linday
the ash	die Eshe	dee eshay
the fir	die Tanne	dee tannay
the willow	die Weide	dee vy-day
the rose	die Rose	dee roh-say
the pink	die Nelke	dee nelkay
the tulip	die Tulpe	dee toolpay
the lily	die Lilie	dee leeleeay
the violet	das Veilchen	dos file*ch*en
the lilac	der Flieder	dair fleeder
the lily of the valley	das Maiblümchen	dos my-blum-*ch*en

COUNTRIES AND NATIONS

The country	das Land	dos lont
the native land	das Vaterland	dos faterlont
the state	der Staat	dair staat
the empire	das Reich	dos riche
the kingdom	das Königreich	dos keunizh-riche
Europe	Europa	Oyropa
the European	der Europäer	dair Oyropayer
America	Amerika	America
the American	der Amerikaner	dair Amerikahner
Asia	Asien	Azi-en
Africa	Afrika	Afrika
the East Indies	Ostindien	Ostindeen

English	German	Pronunciation
the West Indies	Westindien	Vestindeen
the United States	die Vereinigten Staaten	dee fair-ine-izhten Stahten
England	England	Eng-lont
the Englishman	der Engländer	dair Engl*a*nder
Ireland	Irland	Eerlont
the Irishman	der Irländer	dair Eerl*a*nder
Scotland	Schottland	Shotlont
the Scotchman	der Schotte	dair Shottay
France	Frankreich	Frankry*ch*
the Frenchman	der Franzose	dair Frantzo-say
Germany	Deutschland	Doytshlont
the German	der Deutsche	dair Doytshay
Holland	Holland	Hollont
the Dutchman	der Holländer	dair Holl*a*nder
Austria	Oesterreich	Osterry*ch*
the Austrian	der Oesterreicher	dair osterri*ch*er
Prussia	Preussen	Proyssen
the Prussian	der Preusse	dair Proyssay
Russia	Russland	Roosslont
the Russian	der Russe	dair Roossay
Sweden	Schweden	Shvayden
the Swede	der Schwede	dair Shvayday
Denmark	Dänemark	Danemark
the Dane	der Däne	dair Daynay
Switzerland	die Schweiz	die Shvytz
the Swiss	der Schweizer	dair Shvytzer
Spain	Spanien	Spanyen
the Spaniard	der Spanier	dair Spaneeair
Greece	Griechenland	Greech*e*nlont
the Greek	der Grieche	dair Greech*a*y
Turkey	die Türkei	dee T*u*rkye
the Turk	der Türke	dair T*u*rkay
the Jew	der Jude	dair Yooday
the Persian	der Perser	dair Perzer

TRADE

The merchant	der Kaufmann	dair kowfman
the merchandise	die Waare	dee vahray
the wholesale merchant	der Grosshändler	dair grosshandler
the retailer	der Kleinhändler	dair klinehandler
the correspondent	der Correspondent	dair correspondent
the stock	das Lager	dos lahger
the daybook	das Journal	dos yoornol
the ledger	das Hauptbuch	dos howptbooch
the invoice	die Factur	dee factoor
the bill of exchange	der Wechsel	dair vech*s*el
the remittance	die Rimesse	dee rimessay
the acceptance	das Accept	dos accept
the payment	die Bezahlung	dee betzahloong
the receipt	die Quittung	dee quittoong
the buyer	der Käufer	dair koyfer
the seller	der Verkäufer	dair ferkoyfer
the debtor	der Debitor	dair daybeetor
the creditor	der Creditor	dair craydeetor

COMMON ADJECTIVES

Small	klein	kline
narrow	enge	engay
low	niedrig	needrizh
beautiful	schön	sh*o*n
handsome	hübsch	h*u*bsh
ugly	hässlich	h*a*sslich
bad	schlecht	shlech*t*
easy	leicht	lych*t*
heavy	schwer	schvair
soft	weich	vych
true	wahr	vahr
short	kurz	koorts
far	weit	vite
sweet	süss	s*u*s
hollow	hohl	hole
blunt	stumpf	stoompf
delicious	köstlich	k*o*stlich
disagreeable	unangenehm	oonongenaym
honest	ehrlich	ayrlich
polite	höflich	h*o*flich
obliging	gefällig	gef*a*llizh
kind	gütig	g*u*tizh
prudent	klug	kloog
stupid	dumm	doom
ridiculous	lächerlich	l*a*cherlich
reasonable	vernünftig	fairn*u*nftizh
happy	glücklich	gl*u*cklich
unhappy	unglücklich	oongl*u*cklich
glad	froh	fro
satisfied	zufrieden	tsoofreeden
active	thätig	t*a*tizh
rude	grob	grobe
proud	stoltz	stolts
bold	kühn	k*u*n
strong	stark	stark
weak	schwach	shvach
attentive	aufmerksam	owfmerksom
clever	geschickt	geshickt
mild	gelind	gelint
sick	krank	kronk
pale	blass	bloss
healthy	gesund	gezoont
poor	arm	arm
empty	leer	lare
light	hell	hell
dark	dunkel	doonkel
dry	trocken	trocken
wet	nass	noss
dirty	schmutzig	shmootsizh
cheap	billig	billizh

English	German	Pronunciation
clean	rein	rine
tired	müde	m*u*day
angry	böse	b*o*say
merry	lustig	loostizh
old	alt	olt
young	jung	yoong
new	neu	noi
great	gross	gross
good	gut	goot
rich	reich	ri*ch*e
cold	kalt	kolt
warm	warm	varm
long	lang	lang
high	hoch	ho*ch*
full	voll	fol
cool	kühl	k*u*l
near	nahe	nah-ay
hard	hart	hart
light	leicht	li*ch*t
wild	wild	vilt
fat	fett	fett
fine	fein	fine
mild	mild	milt
deep	tief	teef
fresh	frisch	frish
ripe	reif	rife
unripe	unreif	oonrife
bitter	bitter	bitter
small	schmal	shmahl
wide	weit	vite
open	offen	offen
loud	laut	lout
right	recht	re*ch*t
wise	weise	visay
blind	blind	blint
unwell	unwohl	oonvole
hot	heiss	hise
thick	dick	dick
neat	nett	net
thin	dünn	d*u*n
broad	breit	brite
round	rund	roond
false	falsch	falsh
sour	sauer	sour
sharp	scharf	sharf
flat	flach	fla*ch*

COMMON VERBS

To eat	essen	essen
to drink	trinken	trinken
to dream	träumen	troymen
to wash	waschen	voshen
to comb	kämmen	kemmen
to go	gehen	gayen
to speak	sprechen	spra*ch*en
to laugh	lachen	lah*ch*en
to think	denken	denken
to learn	lernen	lernen
to bathe	baden	bahden

English	German	Pronunciation
to break	brechen	bre*ch*en
to bite	beissen	bisen
to cost	kosten	costen
to hear	hören	h*o*ren
to help	helfen	helfen
to give	geben	gayben
to make (do)	machen	mah*ch*en
to do	thun	toon
to ride	reiten	riten
to say	sagen	zahgen
to send	senden	zenden
to seek	suchen	zoo*ch*en
to breakfast	frühstücken	fr*u*st*u*cken
to dine	speisen	spyzen
to arrive	ankommen	ankohmmen
to depart	abreisen	obryzen
to meet	treffen	treffen
to excuse	entschuldigen	entshooldigen
to understand	verstehen	fairstayen
to believe	glauben	glowben
to know	wissen	vissen
to write	schreiben	shriben
to read	lesen	layzen
to pronounce	aussprechen	owsspre*ch*en
to translate	übersetzen	*u*bersetzen
to recollect	sich errinnern	sich erinnern
to forget	vergessen	fairgessen
to promise	versprechen	fairspra*ich*en
to expect	erwarten	airvahrten
to converse	unterhalten	oonterhalten
to express	ausdrücken	owsdr*u*cken
to explain	erklären	airklayren
to tell	sagen	zahgen
to call	rufen	roofen
to weep	weinen	vi-nen
to recommend	empfehlen	empfaylen
to receive	empfangen	empfangen
to send	schicken	shicken
to buy	kaufen	kowfen
to pay	bezahlen	baytsahlen
to order	bestellen	baystellen
to furnish	liefern	leefern
to sell	verkaufen	fairkowfen
to reply	antworten	ontvorten

COMMON ADVERBS

Yes	ja	yah
	ja wohl	yah vole
indeed	in der That	in dair tot
truly	wahrlich	vahrli*ch*
certainly	gewiss	gayviss
surely	sicherlich	zi*ch*erli*ch*
only	nur	noor
some	etwas	etvos
nothing	nichts	ni*ch*ts
much	viel	feel
quite	gänzlich	g*a*ntzli*ch*
very	sehr	zare
so	so	zo

English	German	Pronunciation
thus	also	alzo
how?	wie?	vee?
no	nein	nine
not	nicht	nicht
but	nur	noor
enough	genug	genooch
scarcely	kaum	kowm
all	ganz	gonts
almost	beinahe	by-nah-ay
here	hier	here
there	da	da
where	wo	vo
in	herein	herine
out	heraus	herowse
then	denn	den
now	jetzt	yetst
soon	bald	ballt
till	bis	bis
seldom	selten	zelten
since	seit	zite
ever	immer	immer
never	nie	nee
oft	oft	oft
already	schon	schone
to-day	heute	hoytay
yesterday	gestern	gestern
late	spät	spate
why?	warum?	varoom?
because	weil	vile
if	wenn	ven
perhaps	vielleicht	feelycht

COMMON CONJUNCTIONS

And	und	oont
also	auch	owch
even	sogar	sogar
or	oder	oder
nor	noch	noch
yet	doch	doch
because	weil	vile
that	dass	doss
therefore	daher	dahair

ELEMENTS OF GERMAN GRAMMAR

DECLENSIONS

There are four cases in the declension of German nouns, articles, adjectives, and pronouns: the *nominative,* used to indicate the subject of a verb, or the name of a person or thing addressed; the *genitive,* used to indicate possession; the *dative,* used to indicate an indirect object, or the thing on, to, or for which an action is performed; the *accusative,* used to indicate the direct object, or the thing modified by the action expressed in the verb. The three oblique cases, *genitive, dative,* and *accusative,* may also be governed by prepositions, like the English objective case. Particular prepositions belong with each case, according to meaning; and these, together with the cases they govern, should be carefully committed to memory by the student.

PREPOSITIONS WITH CASES

The prepositions governing the dative signify, in general, states of rest at, by, in, near, with, or opposite to the object, and, with the exception of *aus,* indicating motion *from,* are most often used to express such an idea, literally or figuratively. All, except 10, 14, 15, 16, are placed before their nouns, and 10 may either precede or follow.

1. aus, *out of*
2. ausser, *out of, besides*
3. bei, *at, near, with*
4. binnen, *within*
5. mit, *with, together with*
6. nach, *to, after, according to*
7. seit, *since*
8. von, *of, from, by*
9. zu, *to, at*
10. gemäss, *according to*
11. nächst, *next to*
12. nebst, *together with*
13. sammt, *together with*
14. entgegen, *against, contrary to*
15. gegenüber, *opposite to*
16. zuwider, *contrary to*

The prepositions governing the accusative indicate motion, generally to or toward the object. All of them precede their nouns.

1. bis, *as far as, till*
2. durch, *through, by*
3. für, *for*
4. gegen, *toward, to, against*
5. ohne, *without, but for*
6. um, *about, round, at*
7. wider, *against*

The prepositions governing the genitive may, with four exceptions, be literally translated into English expressions ending in "of." All of them precede their nouns, except 4, 13, 15, 18. The two latter of these follow and are compounded with their nouns, while 13, being two words, takes the noun between.

1. anstatt, or statt, *instead of*
2. diesseit, *on this side*

3. jenseit, *on that side*
4. halben, or halber, *on account of*
5. ausserhalb, *on the outside*
6. innerhalb, *within*
7. oberhalb, *above*
8. unterhalb, *below*
9. kraft, *by virtue of*
10. entlang, *along*
11. laut, *according to*
12. mittelst, vermittelst, *by means of*
13. um—willen, *for sake of*
14. unfern, unweit, *not far from*
15. ungeachtet, *notwithstanding*
16. vermöge, *by dint of*
17. während, *during*
18. wegen, *on account of*

Nine prepositions take either dative or accusative, according as the *place in which* or the *place to which* is indicated. They are:

1. an, *at, on, close to, to*
2. auf, *on, upon*
3. hinter, *behind*
4. in, *in, into, to.*
5. neben, *near, beside*
6. über, *over, across, concerning*
7. unter, *under, among*
8. vor, *before, ago, because of*
9. zwischen, *between*

Three prepositions take either the genitive or the dative:

1. längs, *along*
2. trotz, *in spite of*
3. zufolge, *according to*

Although a number of these words are rarely used, the student should be familiar with their meaning and use, in order to avoid errors liable to occur at a later stage in his studies.

INFLECTION

The nouns, articles, pronouns, and adjectives in German are regularly inflected, which is to say, their terminations are changed according to case and number. In English the only signs of inflection are found in the addition of *'s* to the root of nouns to indicate the possessive (genitive) case and of *s* or *es,* regularly, to indicate the plural number: the personal pronouns alone retain the regular inflection formerly found in both nouns and adjectives.

In German the regular terminations for the articles, pronouns, and strong declension of adjectives are *s* for the genitive masculine, *m* for the dative, and *n* for the accusative. With nouns the regular terminations are *s* or *es* for the genitive, and *e* for the dative. Plurals are regularly formed by the addition of *e, en* or *er,* with terminal *n* or *en* always in the dative. Variations in these matters form the basis for separating nouns into five regular classes of declension, as will be presently explained. In order to proceed logically, the declension of articles will first be noticed.

THE ARTICLES

In German, as in English, there are two articles—properly to be classed as adjectives—the definite and the indefinite. The former is declined as follows:

	Singular			Plural
	Masc.	Fem.	Neuter	M. F. N.
N.	*der*	*die*	*das*	*die,* the
G.	*des*	*der*	*des*	*der,* of the
D.	*dem*	*der*	*dem*	*den,* to, for, at the
A.	*den*	*die*	*das*	*die,* the

The indefinite article, as in French, is simply the numeral, "one," inflected through genders and cases, but without a plural. Thus:

	Masc.	Fem.	Neuter
N.	*ein*	*eine*	*ein,* a
G.	*eines*	*einer*	*eines,* of a
D.	*einem*	*einer*	*einem,* to, for, at a
A.	*einen*	*eine*	*ein,* a

The student will notice that the neuter form of both articles is the same as the masculine in the genitive and dative cases, but has its accusative like its nominative. This peculiarity characterizes the declension of all neuter adjectives and nouns, as will be seen later.

PRONOMINAL ADJECTIVES

After the inflection of the articles, that of the possessive and demonstrative adjectives (sometimes called pronominal adjectives) follows logically. Among these,

mein, meine, mein, my;
dein, deine, dein, thy;
sein, seine, sein, his;
kein, keine, kein, no;

follow exactly the declension of the indefinite article. Precisely on the same model follow the other possessives:

unser, unsere, unser, our;
Ihr, Ihre, Ihr, your;
euer, euere, euer, your;
ihr, ihre, ihr, her, their.

This declension is as follows:

	Masc.	Fem.	Neut.	Plur.
N.	*unser*	*unsere*	*unser*	*unsere*
G.	*unseres*	*unserer*	*unseres*	*unserer*
D.	*unserem*	*unserer*	*unserem*	*unseren*
A.	*unseren*	*unsere*	*unser*	*unsere*

The demonstrative and determinative adjectives,

dieser, diese, dieses, this;
jener, jene, jenes, that;
keiner, keine, keines, no;
mancher, manche, manches, many a;
jeder, jede, jedes, every, each,

are declined according to this model:

	Masc.	Fem.	Neut.	Plur.
N.	*dieser*	*diese*	*dieses*	*diese*
G.	*dieses*	*dieser*	*dieses*	*dieser*
D.	*diesem*	*dieser*	*diesem*	*diesen*
A.	*diesen*	*diese*	*dieses*	*diese*

Since none of these adjectives is used with an article, their case terminations are always the same. With the adjective,

solcher, solche, solches, such,

however, the case endings are like the above model, when used without *ein;* like all other adjectives after *ein,* as will be subsequently explained. When *solch* is used before *ein,* as in "such a house," *solch ein Haus,* case endings are omitted.

Two adjectives have a plural form only, like the above paradigm. They are *beide,* both, and *alle,* all.

THE DECLENSIONS OF NOUNS

In the matter of inflection in the oblique cases and in the formation of the plural, *nouns* present very many variations and several great departures from regular constructions. The subject seems complicated at first sight, but a very little attention to the following classes of declension will give the student a ready clew to proper usage. There are several schemes of classification in use among grammarians—such as the division into "strong" and "weak" declensions, after the analogy of adjectives—but altogether the least confusing classification is to separate the five classes or declensions, as follows:

THE FIRST CLASS OR DECLENSION includes all masculine and neuter nouns ending in *el, en, er, chen,* and *lein.* With these the terminations are the same in the plural—except in the dative, which takes *n,* when it is not found already in the nominative of nouns in *en*—and very many, although not all, modify the leading vowel, when possible. The regular ending for the genitive singular is *s.* A few samples are as follows:

FATHER (M)

Sing.	Plur.
N. *der Vater*	N. *die Väter*
G. *des Vaters*	G. *der Väter*
D. *dem Vater*	D. *den Vätern*
A. *den Vater*	A. *die Väter*

EAGLE (M)

Sing.	Plur.
N. *der Adler*	N. *die Adler*
G. *des Adlers*	G. *der Adler*
D. *dem Adler*	D. *den Adlern*
A. *den Adler*	A. *die Adler*

APPLE (M)

Sing.	Plur.
N. *der Apfel*	N. *die Aepfel*
G. *des Apfels*	G. *der Aepfel*
D. *dem Apfel*	D. *den Aepfeln*
A. *den Apfel*	A. *die Aepfel*

GIRL (N)

Sing.	Plur.
N. *das Mädchen*	N. *die Mädchen*
G. *des Mädchens*	G. *der Mädchen*
D. *dem Mädchen*	D. *den Mädchen*
A. *das Mädchen*	A. *die Mädchen*

Among the nouns that do not modify in the plural we may mention:

Adler, eagle; *Kuchen,* cake;
Maler, painter; *Tropfen,* drop;
Amerikaner, American.

Several nouns in *en* that do not modify in the plural are more generally used in the singular with the termination *e.* They are:

Samen, seed; *Glauben,* faith;
Funken, spark; *Haufen,* heap;
Gedanken, thought; *Frieden,* peace;
Willen, will; *Namen,* name.
Felsen, rock, is often simply *Fels.*

Seven nouns of this class depart from the regular rule by adding *n* in the plural, without modifying the vowel. They are:

Bauer, peasant; *Baier,* Bavarian;
Gevatter, godfather; *Muskel,* muscle;
Pantoffel, slipper; *Stachel,* sting;
Vetter, cousin.

THE SECOND CLASS OR DECLENSION of nouns includes:

(1.) All one-syllable *masculine* nouns, except the seven mentioned in the *third declension,* and a few following the *fourth declension;*

(2.) All *masculine* nouns ending in *at, ich, ig,* and *ling;*

(3.) Most masculine nouns of foreign origin ending in *al, an, ar, ast, ier;*

(4.) One-syllable masculine nouns compounded with a *prepositional prefix,* or with *another noun.*

All such nouns take the ending *e* in the nominative, genitive, and accusative plural, *en* in the dative plural, and, with few exceptions, modify the vowel.

The genitive singular is regularly formed with the ending *s* or *es*, and the dative with *e*. A few exceptions in these cases will also be noted.

A few nouns regularly inflected according to this declension are as follows:

	SON	TREASURE	KING	PALACE
		Singular		
N.	*der Sohn*	*Schatz*	*König*	*Palast*
G.	*des Sohnes*	*Schatzes*	*Königs*	*Palastes*
D.	*dem Sohne*	*Schatze*	*König*	*Palast*
A.	*den Sohn*	*Schatz*	*König*	*Palast*
		Plural		
N.	*die Söhne*	*Schätze*	*Könige*	*Paläste*
G.	*der Söhne*	*Schätze*	*Könige*	*Paläste*
D.	*den Söhnen*	*Schätzen*	*Königen*	*Palästen*
A.	*die Söhne*	*Schätze*	*Könige*	*Palästen*

The use of *s* or of *es* in the genitive singular is largely determined by euphony, as is also that of *e* in the dative. As shown by the last two nouns in the above paradigms, the final *e* in the dative singular is often omitted.

Eleven one-syllable masculine nouns form their oblique cases and plurals by the addition of *en*, without modifying the vowel, as in the *third declension*. They represent either words formerly ending with *e*, or else simple irregularities due to usage. Thus:

Singular	Plural
der Bär, the bear;	*die Bären*
" *Fleck*, the spot;	" *Flecken*
" *Fürst*, the prince;	" *Fürsten*
" *Graf*, the count;	" *Grafen*
" *Held*, the hero;	" *Helden*
" *Herr*, the lord;	" *Herren*
" *Mensch*, the man;	" *Menschen*
" *Narr*, the fool;	" *Narren*
" *Pfau*, the peacock;	" *Pfauen*
" *Prinz*, the prince;	" *Prinzen*
" *Thor*, the simpleton;	" *Thoren*

The word, *Herr*, forms the singular oblique cases *Herrn*, and the plural, *Herren*.

Six words of this declension take *en* in the plural cases and do not modify. They are:

Der Staat, the state; *der Strahl*, the beam; *der Schmerz*, the pain; *der Sporn*, the spur; *der Dorn*, the thorn; *der See*, the lake.

Several nouns that logically belong in this class form their plural with final *er* and vowel modification, after the rule of the *fourth declension*. Thus:

	MAN (M)	ERROR (M)	SPIRIT (M)
		Singular	
N.	*der Mann*	*der Irrtum*	*der Geist*
G.	*des Mannes*	*des Irrtums*	*des Geistes*
D.	*dem Manne*	*dem Irrtum*	*dem Geiste*
A.	*den Mann*	*den Irrtum*	*den Geist*
		Plural	
N.	*die Männer*	*die Irrtümer*	*die Geister*
G.	*der Männer*	*der Irrtümer*	*der Geister*
D.	*den Männern*	*den Irrtümern*	*den Geistern*
A.	*die Männer*	*die Irrtümer*	*die Geister*

THE THIRD CLASS OR DECLENSION of nouns includes:

(1.) All masculine nouns ending in *e;*

(2.) The few monosyllabic nouns already noted;

(3.) Masculine nouns of foreign origin—other than those noted in the last class—which take the accent on the last syllable;

(4.) Several irregular nouns not accented on the last syllable, but forming their plurals as in this class.

This class is sometimes called the "weak declension" from the fact that all cases, except the nominative singular, regularly take final *n* or *en*.

The root vowels are not modified in the plural. Thus:

	BOY	STUDENT	SOLDIER
		Singular	
N.	*der Knabe*	*der Student'*	*der Soldat*
G.	*des Knaben*	*des Student'en*	*des Soldaten*
D.	*dem Knaben*	*dem Student'en*	*dem Soldaten*
A.	*den Knaben*	*den Student'en*	*den Soldaten*
		Plural	
N.	*die Knaben*	*die Student'en*	*die Soldaten*
G.	*der Knaben*	*der Student'en*	*der Soldaten*
D.	*den Knaben*	*den Student'en*	*den Soldaten*
A.	*die Knaben*	*die Student'en*	*die Soldaten*

Several one-syllable masculine nouns, as given under the second declension, are inflected like nouns of this class. Several others, as given under the first declension, have the nominative singular either in *e* or *en*, and apparently follow this class in adding *n* to all other cases, except the genitive singular, which has *ns*. Seven nouns properly in the *first declension*, according to the termination of the nominative singular take *n* in the plural cases, as already noted. Words of Latin origin ending in *or* form the plural by adding *en*. Also, *der Nachbar*, the neighbor, takes *n* in the plural cases, although forming the singular like nouns of the *first declension*. Finally, some neuter

nouns, properly belonging in the *fourth declension*, form their plurals in *n*.

Specimen paradigms of several of these exceptions are as follows:

	NAME (M)	DOCTOR (M)	EYE (N)
		Singular	
N.	*der Name*	*der Doctor*	*das Auge*
G.	*des Namens*	*des Doctors*	*des Auges*
D.	*dem Namen*	*dem Doctor*	*dem Auge*
A.	*den Namen*	*den Doctor*	*das Auge*
		Plural	
N.	*die Namen*	*die Doctoren*	*die Augen*
G.	*der Namen*	*der Doctoren*	*der Augen*
D.	*den Namen*	*den Doctoren*	*den Augen*
A.	*die Namen*	*die Doctoren*	*die Augen*

THE FOURTH CLASS OR DECLENSION of nouns includes:

(1.) All neuter nouns not found in the first class;

(2.) A few masculine nouns, as already explained under the *second declension*.

The regular inflection of this class gives *es* in the genitive and *e* in the dative singular.

All nouns take *n* in the dative plural, but the one-syllable nouns form the other plural cases in *er*, and the remainder in *e*. The root vowel is regularly modified. Thus:

	SONG (N)	BOOK (N)	GUN (N)
		Singular	
N.	*das Lied*	*das Buch*	*das Gewehr*
G.	*des Liedes*	*des Buches*	*des Gewehres*
D.	*dem Liede*	*dem Buche*	*dem Gewehre*
A.	*das Lied*	*das Buch*	*das Gewehr*
		Plural	
N.	*die Lieder*	*die Bücher*	*die Gewehre*
G.	*der Lieder*	*der Bücher*	*der Gewehre*
D.	*den Liedern*	*den Büchern*	*den Gewehren*
A.	*die Lieder*	*die Bücher*	*die Gewehre*

Nouns of this declension ending in *e* in the nominative singular do not add another *e* for the plural. Thus:

Das Gebirge, the mountain; *die Gebirge*
Das Gemalde, the picture; *die Gemälde*
Das Gebäude, the building; *die Gebäude*

THE FIFTH CLASS OR DECLENSION of nouns includes all feminine nouns.

In the singular, these nouns are unchanged, having no case terminations.

In the plural, monosyllabic nouns *regularly* modify the root vowel and add *e* for all cases except the dative, which takes *en*. Nouns of more than one syllable *regularly* form the plural in *n* or *en*, without modifying. Those ending in the feminine termination *in* add *nen* to form the plurals. Thus:

	HAND (F)	FEATHER (F)	QUEEN (F)
		Singular	
N.	*die Hand*	*die Feder*	*die Königin*
G.	*der Hand*	*der Feder*	*der Königin*
D.	*der Hand*	*der Feder*	*der Königin*
A.	*die Hand*	*die Feder*	*die Königin*
		Plural	
N.	*die Hände*	*die Federn*	*die Königinnen*
G.	*der Hände*	*der Federn*	*der Königinnen*
D.	*den Händen*	*den Federn*	*den Königinnen*
A.	*die Hände*	*die Federn*	*die Königinnen*

The exceptions in this declension must be carefully noted, and, as far as possible, committed to memory. Thus:

(1.) All feminine nouns ending in *niss* and one in *sal* take *e* in the plural.

Die Kenntniss, knowledge; *die Kenntnisse.*
Die Trübsal, sorrow; *die Trübsale.*

(2.) Two common feminine nouns ending in *er* follow the rule given under the *first declension*. They merely modify the root vowel in the plural cases and add *en* for the dative. They are:

Die Mutter, the mother; *die Mütter, den Müttern.*
Die Tochter, the daughter; *die Töchter, den Töchtern.*

They are regular in the singular.

(3.) Twenty-seven one-syllable feminine nouns form their plural in *en*, without modifying the root vowel.

Die Art, the kind, species
die Bahn, the road
die Bucht, the bay
die Burg, the old castle
die Fahrt, the passage
die Flur, the field
die Fluth, the flood
die Form, the form
die Frau, the woman
die Gluth, the blaze
die Jagd, the chase
die Last, the load
die Pflicht, the duty
die Post, the post
die Qual, the torment, pang
die Schaar, the troop
die Schlacht, the battle
die Schrift, the writing
die Schuld, the debt
die Spur, the trace, track
die That, the deed
die Tracht, the costume
die Uhr, the watch, clock
die Wahl, the choice
die Welt, the world
die Zahl, the number, figure
die Zeit, the time

DECLENSION OF ADJECTIVES

There are three declensions of adjectives; that is to say, every adjective may be declined in three ways, according to (1) whether it is unqualified by an article or demonstrative; (2) whether it is preceded by the indefinite article; or (3) whether it is preceded by the definite article. These three considerations alone act to modify the case endings.

In the first state, the adjective takes the *strong declension,* with the sole exception of the genitive singular masculine and neuter, where, for the sake of euphony solely, *es* is changed to *en.*

In the second state, which involves the use of the *mixed declension,* the adjective is preceded in the singular by the indefinite article, or in either number by one of the eight adjectives inflected like it, as already given. In the nominative and accusative singular of this declension the three genders take the forms already given in the inflection of *dieser.* In the genitive and dative singular all genders take the termination *en,* In the plural all three genders take *en* final in every case.

In the third state, which is known as the *weak declension,* the adjective is preceded by the definite article, or by *dieser, jener, jeder, mancher, welcher.* Then, because the gender is definitely indicated, it follows the rule of the *third declension* of nouns, having the final *e* in the nominative singular of all persons, and final *en* in all other cases, singular and plural, *except the accusative singular feminine and neuter,* which take final *e.*

These rules may be understood from the following paradigms:

STRONG DECLENSION

	Masculine	Feminine	Neuter	Plural
N.	*armer Mann*	*schöne Frau*	*gutes Kind*	*arme Leute*
G.	*armen Mannes*	*schöner Frau*	*guten Kindes*	*armer Leute*
D.	*armem Manne*	*schöner Frau*	*gutem Kinde*	*armen Leuten*
A.	*armen Mann*	*schöne Frau*	*gutes Kind*	*arme Leute*

MIXED DECLENSION

	Masculine	Feminine	Neuter	Plural
N.	*dein guter Vater*	*deine schöne Mutter*	*dein kleines Kind*	*deine lieben Verwändter*
G.	*deines guten Vater*	*deiner schönen Mutter*	*deines kleinen Kind*	*deinen lieben Verwändter*
D.	*deinem guten Vater*	*deiner schönen Mutter*	*deinem kleinen Kind*	*deiner lieben Verwändtern*
A.	*deinen guten Vater*	*deine schöne Mutter*	*dein kleines Kind*	*deine lieben Verwändter*

WEAK DECLENSION

	Masculine	Feminine	Neuter	Plural
N.	*der brave Mann*	*die süsse Dame*	*das liebe Kind*	*die guten Eltern*
G.	*des braven Mannes*	*der süssen Dame*	*des lieben Kind*	*der guten Eltern*
D.	*dem braven Manne*	*der süssen Dame*	*dem lieben Kind*	*den guten Eltern*
A.	*den braven Mann*	*die süsse Dame*	*das liebe Kind*	*die guten Eltern*

Careful study of these paradigms will reveal the fact that one end attained in the proper use of adjectives is to designate the gender of the noun. For this reason the strong declension has the full case endings, as in *dieser* and other demonstratives and relatives not to be preceded by an article. With *ein,* or with any one of the several adjectives declined like it, the proper designation of gender is necessary in the nominative and accusative singular only; hence this order follows the "mixed declension." With the definite article, or with one of the several adjectives declined like it, no further designation of gender is required in the following adjective. As in the articles, definite and indefinite, and in the several adjectives declined like them, the determinative adjective preceding the noun is the same in any given plural case for any gender in the noun.

When two or more adjectives precede one noun, the same rules hold, the whole matter of terminations in each case being decided by the definiteness or indefiniteness of the article used or the absence of articles. Thus:

guter, alter Johann
ein guter, alter Mann
der gute, alte Mann, etc.

ADJECTIVES USED SUBSTANTIVELY

In this connection it is necessary to add only a few remarks:

(1.) When an adjective is used as a noun, or when a noun is evidently derived from an adjective, the rules regarding case

terminations after articles or demonstratives are always followed. Thus:

From *fremd*, "strange," we have *der Fremde*, but *ein Fremder*, "a stranger"; from *deutsch*, "German," we have *der Deutsche*, but *ein Deutscher*; from *gelehrt*, "learned," we have *der Gelehrte*, but *ein Gelehrter*.

Such words follow the rule of the weak or mixed declension, forming all the oblique cases by adding *en*.

(2.) When an *abstract* neuter noun is formed from an adjective, the case terminations follow on the declension proper in its use as an adjective. Thus: *das Gute*, "the good"; *das Schöne*, "the beautiful"; *das Wahre*, "the true," etc.

(3.) Any adjective-abstract-noun preceded by *etwas, mehr, nichts, viel, wenig*, takes endings according to the *strong declension* of adjectives.

RULES FOR INFLECTION

Adjectives ending in *el* regularly drop the *e* before the *l*, and sometimes the *e* (of the case ending) following the *l*. Thus: From *edel*, "noble," we have *die edle Frau*; or from *eitel*, "vain," *die eitle Frau*. In the oblique cases of the singular and in the plural, the *e* of the root may remain and the *e* of the ending be dropped. Thus: *die edeln Frauen* or *die eiteln Frauen* is the form occasionally found.

Adjectives ending in *er* or *en* do not regularly drop the *e* of the root, but frequently drop that belonging to the case ending. Thus: *ein bitterer Trank*, but *eines bittern Trankes*.

The adjective *hoch*, "high," gives its root as *hoh* when declined. Thus: *das hohe Haus; ein hoher Berg;* but *das Haus ist hoch*, and *der Berg ist hoch*.

COMPARISON OF ADJECTIVES

Adjectives are compared, as in English, by the addition of *r* or *er* to the root for the comparative, and of *st* or *est* for the superlative.

The root vowel, if *a, o, u*, is regularly modified in the comparative and superlative degrees, although a number of adjectives do not follow this rule.

Adjectives whose positive degree has a final *e* take only *r* in the comparative.

The superlative of adjectives is regularly formed only by adding *st* to the root. The ending *est* is given mostly to those ending in three consonants or a sibilant (*z, s*, or *sch*). *Gross*, "great," however, merely adds *t* for the superlative.

Adjectives ending in *el* drop the *e* of the root *in the comparative*, but not in the superlative.

While the comparatives and superlatives of adjectives are regularly declined with case endings when in agreement with nouns, such endings are omitted when they are merely used as predicates. Thus:

Der hohe Baum; der höhere Baum; der höchste Baum. But, *dieser Baum ist höher* and *jener Baum ist am höchsten.*

Most predicate superlatives use the form just given, as in *am schönsten*, "the handsomest"; *am besten*, "the best"; *am ältesten*, "the oldest," etc. This form is sometimes used, *auf's schönste; auf's beste.*

Among irregularities in comparison may be mentioned:

gut, besser, am besten
gross, grosser, am grössten
hoch, höher, am höchsten
nahe, näher, am nächsten
viel, mehr, am meisten
viele, mehrere, am meisten

Adjectives of two or more syllables and monosyllables ending in *au* never modify in the comparative and superlative degrees. The following one-syllable adjectives also never modify:

Blass, pale	*morsch*, brittle
bunt, variegated	*nackt*, naked
fahl, fallow	*platt*, flat
falsch, false	*plump*, clumsy
froh, joyful	*roh*, raw
gerade, straight	*rund*, round
gesund, healthy	*sanft*, gentle
glatt, smooth	*satt*, satisfied
hohl, hollow	*schlaff*, slack
hold, kind	*schlank*, slender
kahl, bald	*starr*, numb
karg, stingy	*stolz*, proud
klar, clear	*straff*, stiff
knapp, tight	*stumm*, dumb
lahm, lame	*toll*, mad
los, loose	*voll*, full
matt, wearied	*zahm*, tame

RELATIVE ADJECTIVES

There are in German, as in English, a number of adjectives, known as "relative adjectives," which involve, as predicates, either an oblique case of a noun or the infinitive of a verb. Many of these words are not declined; others are ordinary ("absolute") adjectives used as predicates in certain idioms. Thus, we say in English, "I am not *aware* of it," and "I am not *sure* of it" (or "about it").

Such adjectives govern either the genitive or the dative case.

The following relative adjectives govern the genitive:

bedürftig, in want of
beflissen, diligent in
befugt, authorized
benöthigt, in need of
bewusst, conscious of
eingedenk, remembering
fähig, capable of
froh, happy in
gewärtig, in expectation of
gewiss, certain of
kundig, acquainted with
mächtig, master of
müde, tired of
schuldig, guilty of
theilhaft, partaker of
verdächtig, suspected of
verlustig, losing
voll, full of
würdig, worthy of

The following govern the dative:

ähnlich, resembling
angemessen, suited to
angenehm, agreeable
anstössig, offensive
bekannt, known
bequem, convenient
bewusst, known
dienlich, serviceable
eigen, own
fremd, strange
freundlich, friendly
gegenwärtig, present to
geläufig, fluent
gemäss, suited to
geneigt, inclined
gewogen, kind
gewachsen, equal to
gleich, like
gnädig, gracious
heilsam, salutary
hold, kind
lästig, troublesome
lieb, dear, agreeable
nachtheilig, hurtful
nahe, near
nützlich, useful
schädlich, injurious
schuldig, indebted
treu, true, faithful
überlegen, superior
unvergesslich, ever memorable to
verdächtig, suspected by
verderblich, destructive to
verhasst, odious to
verwandt, related
vortheilhaft, advantageous
widrig, loathsome
willkommen, welcome
zugethan, addicted to

Among these adjectives commonly used relatively the following are never declined: *eingedenk, theilhaft, verlustig, gemäss, geneight, gewogen, gewachsen, gleich, zugethan.*

NUMERICAL ADJECTIVES

Among cardinal numbers only *one*, *two* and *three* are inflected, as will be explained later. Others take the dative termination, *en*, when used substantively. Ordinals, when, as in general, following the definite article, take case endings of the *weak declension* of adjectives. The numerals are as follows:

CARDINAL NUMBERS

One, *ein, eins*
two, *zwei*
three, *drei*
four, *vier*
five, *fünf*
six, *sechs*
seven, *sieben*
eight, *acht*
nine, *neun*
ten, *zehn*
eleven, *elf*
twelve, *zwölf*
thirteen, *dreizehn*
fourteen, *vierzehn*
fifteen, *fünfzehn*
sixteen, *sechszehn*
seventeen, *siebenzehn*
eighteen, *achtzehn*
nineteen, *neunzehn*
twenty, *zwanzig*
21, *ein und zwanzig*
22, *zwei und zwanzig*
23, *drei und zwanzig*
30, *dreissig*
40, *vierzig*
50, *fünfzig*
60, *sechszig*
70, *siebenzig*
80, *achtzig*
90, *neunzig*
100, *hundert*
101, *hundert und eins*
102, *hundert und zwei*
200, *zwei hundert*
300, *drei hundert*
400, *vier hundert*
500, *fünf hundert*
600, *sechs hundert*
700, *sieben hundert*
800, *acht hundert*
900, *neun hundert*
1000, *tausend*
2000, *zwei tausend*
3000, *drei tausend*
10000, *zehn tausend*
a million, *eine Million*
1859, *ein Tausend acht Hundert neun und fünfzig*

ORDINAL NUMBERS

The first, *der Erste*
the 2d, *der Zweite*
the 3d, *der Dritte*
the 4th, *der Vierte*
the fifth, *der Fünfte*
the 6th, *der Sechste*
the 7th, *der Siebente*
the 8th, *der Achte*
the 9th, *der Neunte*
the 10th, *der Zehnte*
the 11th, *der Elfte*
the 12th, *der Zwölfte*
the 13th, *der Dreizehnte*
the 14th, *der Vierzehnte*
the 15th, *der Fünfzehnte*
the 16th, *der Sechszehnte*
the 17th, *der Siebenzehnte*
the 18th, *der Achtzehnte*
the 19th, *der Neun-Zehnte*
the 20th, *der Zwanzigste*
the 21st, *der Ein und Zwanzigste*
the 22d, *der Zwei und Zwanzigste*
the 23d, *der Drei und Zwanzigste*
the 30th, *der Dreissigste*
the 40th, *der Vierzigste*
the 50th, *der Fünfzigste*
the 60th, *der Sechszigste*
the 70th, *der Siebenzigste*
the 80th, *der Achzigste*
the 90th, *der Neunzigste*
the 100th, *der Hundertste*
the 101st, *der Hundert und erste*
the 200th, *der Zweihundertste*
the 300th, *der Dreihundertste*
the 1000th, *der Tausendste*

COLLECTIVE NUMBERS

A half, *ein Halb*
a third, *ein Drittel*
a fourth, *ein Viertel*
a fifth, *ein Fünftel*
a sixth, etc., *ein Sechstel*
one and a half, *anderthalb*
two and a half, *dritthalb*
three and a half, *viertehalb*
four and a half, *fünftehalb*
five and a half, etc., *sechstehalb*.

a pair, *ein Paar*
a dozen, *ein Dutzend*
a score, *Zwanzig*
firstly, *erstens*
secondly, *zweitens*
thirdly, *drittens*
the first time, *das Erstemal*
the second time, *das Zweitemal*
once, *einmal*
twice, *zweimal*
three times, *dreimal*
all times, *allemal*
every time, *jedesmal*
singly, *einfach*
many times, *manchmal*
double, *doppelt*
threefold, *dreifach*
fourfold, *vierfach*
one sort, *einerlei*
two sorts, *zweierlei*
ten sorts, *zehnerlei*
of all kinds, *allerlei*
of many kinds, *vielerlei*
of various kinds, *mancherlei*

The numeral *eins*, "one," is declined:

(1.) Like the indefinite article, when preceded by no other declinable word. Thus: *ein Mann*, "one man"; *eine Frau*, "one woman"; *ein Kind*, "one child."

(2.) Like *dieser*, when without a following noun, or when referring to some noun understood. Thus: *einer von uns*, "one of us"; *eine meiner Schwestern*, "one of my sisters."

(3.) Like an adjective of the *weak declension*, when preceded by the definite article. Thus: *der eine Mann*, "the one man"; *der eine gute König*, "the one good king."

(4.) Like an adjective of the strong declension when preceded by a possessive adjective. Thus: *meine eine Schwester*, "my one sister"; *dein eines Kind*, "thy one child," etc.

The numerals *zwei* and *drei* are declined when not preceded by an article or other declinable word. Thus:

N.	*zwei*	*drei*
G.	*zweier*	*dreier*
D.	*zweien*	*dreien*
A.	*zwei*	*drei*

PRONOUNS

The German pronouns are declined regularly, like articles and demonstrative and possessive adjectives, never changing their endings.

There are five classes of pronouns: *personals; possessives*, derived from possessive adjectives; *demonstratives*, from demonstrative adjectives; *interrogatives* and *relatives*.

One point that will likely puzzle the beginner is that the third person singular for "she" is the same as that for "you," singular or plural, and as that for "they," plural. It is well to remember, however, that the pronoun for "you" is always capitalized, like a noun, and that the one for "she" is declined differently.

PERSONAL PRONOUNS

	Singular		*Sing. and Plur.*
	1st Person	2d Person	2d Person
N.	*ich*, I	*du*, thou	*Sie*, you
G.	*meiner*, of me	*deiner*, of thee	*Ihrer*, of you
D.	*mir*, to me	*dir*, to thee	*Ihnen*, to you
A.	*mich*, me	*dich*, thee	*Sie*, you

	Singular 3d Person		
	Masc.	Fem.	Neut.
N.	*er*, he	*sie*, she	*es*, it
G.	*seiner*, of him	*ihrer*, of her	*seiner*, of it
D.	*ihm*, to him	*ihr*, to her	*ihm*, to it
A.	*ihn*, him	*sie*, her	*es*, it

	Plural		
	1st Person	2d Person	3d Person
N.	*wir*, we	*ihr*, ye	*sie*, they
G.	*unser*, of us	*euer*, of you	*ihrer*, of them
D.	*uns*, to us	*euch*, to you	*ihnen*, to them
A.	*uns*, us	*euch*, you	*sie*, them

In addition to these, we have the reflexive pronoun, *sich*, "self," only in the dative and accusative cases.

The personal pronouns are used with proper case prepositions, *when referring to persons*, when inanimate objects are designated the adverb *da*, "there," is prefixed to the preposition. Thus:

Mit mir, with me; *von dir*, from thee; *für ihn*, for him; *ohne Sie*, without you; *damit*, with it; *dafür*, for it; *davon*, from it, of it; *darin*, in it.

In the last, it will be noticed that *da* becomes *dar* for sake of euphony.

The pronoun, *Ihr*, "you," is used as the plural of *du*, in addressing several persons familiarly. *Sie* is used in formal discourse in addressing either one or several persons.

The reflexive, *sich*, is used only with the third personal pronouns and with *Sie*, "you." With the first and second personal pronouns, the dative or accusative cases serve all uses of reflexives.

POSSESSIVE PRONOUNS

The possessive pronouns, properly so called, are as follows:

der, die, das meinige, or, *meiner, meine, meines*, mine
der, die, das deinige, or, *deiner, deine, deines*, thine

der, die, das seinige, or, *seiner, seine, seines,* his, its
der, die, das ihrige, or, *ihrer, ihre, ihres,* hers
der, die, das unsrige, or, *unserer, unsere, unseres,* ours
der, die, das eurige, or, *euerer, euere, eueres, yours*
der, die, das Ihrige, or, *Ihrer, Ihre, Ihres,* yours
der, die, das ihrige, or, *ihrer, ihre, ihres,* theirs

DEMONSTRATIVE PRONOUNS

The demonstrative pronouns are merely the demonstrative adjectives *dieser,* "this," and *jener,* "that," used without nouns. It is common, also, to use *dies,* "this," and *das,* "that," in very *indefinite* pronominal sentences. Thus: *Das ist ein Deutscher,* "That is a German"; *Dies ist mein Haus,* "This is my house."

INTERROGATIVES AND RELATIVES

German *interrogative* and *relative* pronouns, as in English, are usually the same words. The two leading relatives are *der, die, das,* and *welcher, welche, welches.* They are used in very much the same kind of sentences, although the former is used much in the same way as the English relative "that." They are declined, as follows, and it is necessary to note that the former *differs from the definite article* in the *genitive singular* and in the *genitive* and *dative* plural:

	Masc.	Fem.	Neut.	Plur.
N.	*der*	*die*	*das*	*die*
G.	*dessen*	*deren*	*dessen*	*deren*
D.	*dem*	*der*	*dem*	*denen*
A.	*den*	*die*	*das*	*die*

	Masc.	Fem.	Neut.	Plur.
N.	*welcher*	*welche*	*welches*	*welche*
G.	———	———	———	———
D.	*welchem*	*welcher*	*welchem*	*welchen*
A.	*welchen*	*welche*	*welches*	*welche*

Although the genitives, singular and plural, of *welcher* are frequently given, the approved custom is to use the genitives of the relative *der* wherever required in a sentence. The relative, *welcher,* may be used as an adjective with a noun, after the fashion of the English "which"; as in "which thing he did."

Two other relatives are frequently used; the first, *wer,* "who," most often as the English "he who," never, except in oblique cases, as a true relative in a consecutive clause; the second, *was,* "what," like the first, or like a true relative. The distinction between the use of *der* and *welcher* and that of *was* is that the former relate most often to the noun in the principal clause, as with the English "which" and "that," while the latter relates to the clause as a whole, or to the idea expressed by it. It is often used, however, with such words as *alles,* "everything"; *nichts,* "nothing," etc., just as the other relatives often nouns. Thus:

Alles was nicht angebunden ist, ist los, "Everything that is not tied down is loose."
Kaufe ja nichts was von keinen Nützen ist, "Never buy anything that is of no use."

Wer and *was* are declined, as follows:

Masc. and Fem.	Neuter
wer, who	*was,* what
wessen, whose	*wessen,* of what
wem, to whom	———
wen, whom	*was,* what

The dative of *wer* and *was* is occasionally supplied by a prepositional compound of precisely the same class as are used in referring to things with personal pronouns.

Among such compounds are *worauf, woraus, wofür, worin, womit, worüber, wovon, wozu;* all combinations of the conjunction *wo,* rendered often *wor* for euphony.

RELATIVE CLAUSES

In a relative clause, just as in one introduced by a so-called "subordinating conjunction," the verb comes last, and, if of a compound tense, the auxiliary is last. Thus:

Es giebt manche Thieren, die nur einen Tag leben, "There are many animals that live only one day."
Hier ist das Buch, das (or *welches*) *Sie mir gebracht haben,* "Here is the book that you brought me."

The principal "subordinating conjunctions" are as follows:

als, when, as	*nachdem,* after
auf dass, in order that	*ob,* whether, if
bis, till	*obgleich, obschon,* although
da, as, since	*obwohl,* although
dass, that, in order that	*seit, seitdem,* since
damit, in order that	*sobald,* as soon as
ehe, bevor, before	*so dass,* so that
falls, wofern, in case that	*so oft als,* whenever
	um dass, in order that
indem, as, while	*ungeachtet,* notwithstanding
je—(desto), the—(the)	

während, while
wann, when
warum, why
wenn, if, when
wenn—auch, although
weil, because
wie, as, how
weshalb, weswegen, wherefore
wie—auch, however
wo, where

The uses of *wer* and *was* are illustrated in the following sentences:

Wer nicht hören will, muss fühlen, "He who will not hear, must feel."

Das, was er erzählt hat, ist vollkommen wahr, "What he has related is perfectly true."

The relatives, *welcher, wer,* and *was,* are also used as interrogatives, in about the same fashion as in English. The prepositional combinations are also used for the oblique cases of *wer* and *was* in asking questions.

One notable idiom of the German language is formed with *was.* That is in asking a question beginning "What kind of," which is rendered in German with *was für.* Thus:

Was für ein Mensch ist dies? "What sort of a person is this?"

Occasionally *was für* is used where the English has merely "what" (sometimes "which") in an indefinite question. Thus, the above sentence may also mean, "What (or which) man is this?"

This construction is also used in exclamations. Thus:

Was für ein Mensch! "What a person!"

THE VERB

The conjugation of the German verb is very simple and depends upon only a few general principles. It includes five moods —the *infinitive, indicative, subjunctive, conditional, imperative,* also present and past participles. The *indicative* and *subjunctive* moods have each six tenses—*present, imperfect, perfect, pluperfect, first future* and *second future* (or future perfect). The *conditional mood* has two tenses—the *first* and *second,* corresponding, respectively, to the English "I should (be)" and "I should have (been)." The *infinitive* has a present and a past, while the imperative, as in English, is altogether in the present.

The *present tense,* as in English, is formed direct from the present infinitive, and the *imperfect tense* comes direct from it by the addition of the ending *te* or *ete,* as euphony may require.

The perfect participle is formed by prefixing the syllable *ge* to the root or perfect stem, and adding the ending *t* or *en* to the same.

All other tenses, as in English, are formed by using, as auxiliaries, tenses of the verb, *werden,* "to become," for the *future,* "shall" and the *conditional* "should"; and tenses of the verbs, *haben,* "to have," or of *sein,* "to be," for the *perfect, pluperfect,* and *future perfect* tenses.

The *imperfect,* and often the *present,* of the *subjunctive* of auxiliary and strong verbs, with *a, o, u,* as root vowel is modified.

The verb, *werden,* is also used in forming the passive tenses, where we use the verb "to be."

The verb, *haben,* is used regularly in forming the compound tenses of transitive verbs, while the verb, *sein,* is used with intransitive verbs.

There are a number of variations, however, subject to the following rules:

Haben is used with (a) impersonal and reflexive verbs; (b), all the *modal* auxiliaries, to be given later; (c) intransitive verbs followed by the genitive or dative or by the accusative with a preposition; (d) intransitive verbs denoting a *permanent* state or *action without motion to or from,* except *sein,* "to be," *bleiben,* "to stay," *legen,* "to lie," *schlafen,* "to sleep," *schwimmen,* "to swim," *stehen,* "to stand," *wohnen,* "to dwell"; (e) with verbs denoting actions or states that impress the five senses, *i.e.* do things that are heard, seen, smelt, tasted, felt, with *weinen,* "to weep," and a few others.

Sein is used (a) with its own compound tenses, as *ich bin gewesen,* "I have been"; (b) with verbs expressing *motion* to or from a place, or *transition* to or from a state; (c) with most such verbs having the prefixes *er* and *ver.*

In addition to the three auxiliaries of tense, which are regularly used in forming the compound tenses, there are six auxiliaries of mood, not necessarily used in the conjugation of any verb, and expressing the ideas of the English verbs, "can," "may," "must," "ought," "will" (intend), and "let" (permit). They are *können, mögen, müssen, sollen, wollen, dürfen.* In addition we have the verb, *lassen,* "to let (do), to have (a thing) done," which is generally called the "causative auxiliary."

While the English equivalents given to these words are correct for general use, special expressions can be learned only from idiomatic sentences, such as will be given later.

THE AUXILIARIES OF TENSE

THE AUXILIARY "HABEN," TO HAVE

Principal Parts: present infinitive, *haben;* imperfect indicative, *hatte;* past participle, *gehabt.*

INDICATIVE	SUBJUNCTIVE
Present	*Present*
ich habe, I have	*ich habe,* I have, or (that) I may have, etc.
du hast, thou hast	*du habest,* thou have
er hat, he has	*er habe,* he have
wir haben, we have	*wir haben,* we have
ihr habt, you have	*ihr habet,* you have
Sie haben, you have	*Sie haben,* you have
sie haben, they have	*sie haben,* they have
Imperfect	*Imperfect*
ich hatte, I had	*ich hätte,* I had, or (that) I might have, etc.
du hattest, thou hadst	*du hättest,* thou hadst
er hatte, he had	*er hätte,* he had
wir hatten, we had	*wir hätten,* we had
ihr hattet, you had	*ihr hättet,* you had
Sie hatten, you had	*Sie hätten,* you had
sie hatten, they had	*sie hätten,* they had
Future	*Future*
ich werde haben, I shall have	*ich werde haben,* (that) I shall have
du wirst haben, thou wilt have	*du werdest haben,* thou wilt have
er wird haben, he will have	*er werde haben,* he will have
wir werden haben, we shall have	*wir werden haben,* we shall have
ihr werdet haben, you will have	*ihr werdet haben,* you will have
Sie werden haben, you will have	*Sie werden haben,* you will have
sie werden haben, they will have	*sie werden haben,* they will have

The *compound* and *conditional* tenses are formed as follows. As in English, only the auxiliaries are inflected:

PERFECT.—*Indicative,* "I have had," *Ich habe gehabt,* etc. *Subjunctive,* "I have had" (preceded by *wenn,* "if," *dass,* "that," or some other suitable conjunction), *Ich habe gehabt,* inflected like *present subjunctive.*

PLUPERFECT.—*Indicative,* "I had had," *Ich hatte gehabt,* inflected like *imperfect indicative. Subjunctive,* "I had had," *Ich hätte gehabt,* inflected like *imperfect subjunctive.*

FUTURE PERFECT.—*Indicative,* "I shall have had", *Ich werde gehabt haben. Subjunctive,* "I shall have had," *Ich werde gehabt haben,* inflected like *subjunctive present* of *werden.*

CONDITIONAL.—*First,* "I should have," *Ich würde haben. Second,* "I should have had," *Ich würde gehabt haben.*

IMPERATIVE

habe, have thou
habe er, let him have
haben wir, let us have
lasst uns haben, let us have
habt, have (you)
haben Sie, have you
haben sie, let them have

INFINITIVES

Present: haben, to have
Perfect: gehabt haben, to have had

PARTICIPLES

Present: habend, having
Past: gehabt, had

THE AUXILIARY "SEIN," TO BE

Principal Parts: *sein, war, gewesen*

INDICATIVE	SUBJUNCTIVE
Present	*Present*
ich bin, I am	*ich sei,* (that) I may be
du bist, thou art	*du seiest,* thou mayest be
er ist, he is	*er sei,* he may be
wir sind, we are	*wir seien,* we may be
ihr seid, you are	*ihr seiet,* you may be
Sie sind, you are	*Sie seien,* you may be
sie sind, they are	*sie seien,* they may be
Imperfect	*Imperfect*
ich war, I was	*ich wäre,* (that) I were
du warst, thou wast	*du wärest,* thou wert
er war, he was	*er wäre,* he were
wir waren, we were	*wir wären,* we were
ihr waret, you were	*ihr wäret,* you were
Sie waren, you were	*Sie wären,* you were
sie waren they were	*sie wären,* they were
Future	*Future*
ich werde sein, I shall be	*ich werde sein,* (that) I shall be
du wirst sein, thou wilt be	*du werdest sein,* thou wilt be
er wird sein, he will be	*er werde sein,* he will be
wir werden sein, we shall be	*wir werden sein,* we shall be
ihr werdet sein, you will be	*ihr werdet sein,* you will be
Sie werden sein, you will be	*Sie werden sein,* you will be
sie werden sein, they will be	*sie werden sein,* they will be

The compound tenses of *sein* are formed like those of *haben,* except that tenses of *sein* are always used as auxiliaries. Thus: *ich bin gewesen,* "I have been"; *ich sei gewesen,* "[If or that] I have been"; *ich war gewesen,* "I had been," etc., etc.

THE AUXILIARY "WERDEN," TO BECOME (TO GET, TO GROW)

Principal Parts: *werden, wurde, geworden*

INDICATIVE

Present

ich werde, I become
du wirst, thou becomest
er wird, he becomes
wir werden, we become
ihr werdet, you become
Sie werden, you become
sie werden, they become

Imperfect

ich wurde (*ward*), I became
du wurdest, thou becamest
er wurde, he became
wir wurden, we became
ihr wurdet, you became
Sie wurden, you became
sie wurden, they became

Future

ich werde werden, I shall become
du wirst werden, thou wilt become
er wird werden, he will become
wir werden werden, we shall become
ihr werdet werden, you will become
Sie werden werden, you will become
sie werden werden, they will become

Perfect

ich bin geworden, I have become
du bist geworden, thou hast become
er ist geworden, he has become
wir sind geworden, we have become
ihr seid geworden, you have become
Sie sind geworden, you have become
sie sind geworden, they have become

SUBJUNCTIVE

Present

ich werde, (that) I (may) become
du werdest, thou become
er werde, he become
wir werden, we become
ihr werdet, you become
Sie werden, you become
sie werden, they become

Imperfect

ich würde, I became
du würdest, thou becamest
er würde, he became
wir würden, we became
ihr würdet, you became
Sie würden, you became
sie würden, they became

Future

ich werde werden, I shall become
du werdest werden, thou wilt become
er werde werden, he will become
wir werden werden, we shall become
ihr werdet werden, you will become
Sie werden werden, you will become
sie werden werden, they will become

Perfect

ich sei geworden, I have become
du seiest geworden, thou hast become
er sei geworden, he has become
wir seien geworden, we have become
ihr seiet geworden, you have become
Sie seien geworden, you have become
sie seien geworden, they have become

The other compound tenses are formed with proper tenses of *sein,* "to be." The construction is so exactly like that followed in English that it is necessary only for the student to remember that the Germans say "I am been" and "I was been," for "I have been" and "I had been"; or, "I am become" and "I was become," for "I have become" and "I had become."

If, in a dependent clause (introduced by a relative, or by a subordinating conjunction), an auxiliary (*haben, sein, werden*) occurs with two infinitives, the auxiliary is not removed to the end of the clause, but immediately precedes the infinitives:

Der Wind bläst meinen Hut so schnell fort, dass ich ihn kaum werde fangen können.

Having mastered the conjugation of the three *tense auxiliaries,* we may turn to general verbs.

These are of two classes of verbs, called respectively the *weak* and the *strong,* or the *regular* and the *irregular.* As may be seen, these terms are used in a precisely opposite sense from the French, where a "strong verb" is one that does not change its root, and, hence, is "regular"; and where a "weak verb" is one that does change its root, and, hence, is "irregular." In German the "strong" verbs change, and the "weak" do not. The "weak" verbs follow the rules for forming the simple tenses; the "strong" do not.

PARADIGM OF A WEAK OR REGULAR VERB

"LOBEN," TO PRAISE

Principal Parts: *loben, lobte, gelobt*

ACTIVE VOICE

INDICATIVE

Present

ich lobe, I praise
du lobst, thou praisest
er lobst, he praises
wir loben, we praise
ihr lobt, you praise
Sie loben, you praise
sie loben, they praise

Imperfect

ich lobte, I praised
du lobtest, thou praisedst
er lobte, he praised
wir lobten, we praised
ihr lobtet, you praised
Sie lobten, you praised
sie lobten, they praised

Future

ich werde loben, I shall praise
du wirst loben, thou wilt praise
er wird loben, he will praise
wir werden loben, we shall praise
ihr werdet loben, you will praise
Sie werden loben, you will praise
sie werden loben, they will praise

Perfect

ich habe gelobt, I have praised
du hast gelobt, thou hast praised
er hat gelobt, he has praised

SUBJUNCTIVE

Present

ich lobe, I praise
du lobest, thou praise
er lobe, he praise
wir loben, we praise
ihr lobet, you praise
Sie loben, you praise
sie loben, they praise

Imperfect

ich lobte, I praised
du lobtest, thou praised
er lobte, he praised
wir lobten, we praised
ihr lobtet, you praised
Sie lobten, you praised
sie lobten, they praised

Future

ich werde loben, I shall praise
du werdest loben, thou wilt praise
er werde loben, he will praise
wir werden loben, we shall praise
ihr werdet loben, you will praise
Sie werden loben, you will praise
sie werden loben, they will praise

Perfect

ich habe gelobt, I have praised
du habest gelobt, thou hast praised
er habe gelobt, he has praised

IMPERATIVE

lobe, praise thou
lobe er, let him praise
loben wir, let us praise
lasst uns loben, let us praise
lobet, praise (you)
loben Sie, praise (you)
loben sie, let them praise

The remainder of the compound tenses are formed with inflections of either *werden* or *haben,* or both, with *loben,* or *gelobt,* as the case may be, instead of *haben* and *gehabt,* in the paradigm of *haben* given above.

THE PASSIVE VOICE of a regular verb may be understood from the following synopsis, always remembering that the tenses of *werden* are inflected as in the foregoing paradigms:

SYNOPSIS OF "LIEBEN," TO LOVE

PASSIVE VOICE

INDICATIVE	SUBJUNCTIVE
Present *er wird geliebt,* he is (becomes) loved	*Present* *er werde geliebt,* he may be loved
Imperfect *er wurde (ward) geliebt,* he was loved	*Imperfect* *er würde geliebt,* he might be loved
Future *er wird geliebt werden,* he will be loved	*Future* *er werde geliebt werden,* he will be loved
Perfect *er ist geliebt worden,* he has been loved	*Perfect* *er sei geliebt worden,* he may have been loved
Pluperfect *er war geliebt worden,* he had been loved	*Pluperfect* *er wäre geliebt worden,* he might have been loved
Future Perfect *er wird geliebt worden sein,* he will have been loved	*Future Perfect* *er werde geliebt worden sein,* he will have been loved

CONDITIONAL

First Conditional	*Second Conditional*
er würde geliebt werden, he would be loved	*er würde geliebt worden sein,* he would have been loved

IMPERATIVE

Present

werde geliebt, be loved

INFINITIVES

Present

geliebt werden, to be loved

Perfect

geliebt worden sein, to have been loved

PARTICIPLES

Perfect

geliebt worden, having been loved

As will be noticed here, the prefix *ge* of the *auxiliary past participle* is omitted after the *past participle* of the main verb. This

rule is always observed by the past participle of every verb logically and grammatically *following* the past participle of another.

In the STRONG, or IRREGULAR, verbs the principal irregularities occur in the formation of the imperfect tenses and in the imperative mood. The *subjunctive imperfect* also modifies *a, o,* or *u,* like *haben.* In the compound tenses and in the passive voice the construction is perfectly regular, as in the foregoing paradigms.

PARADIGM OF A STRONG, OR IRREGULAR, VERB

"GEBEN," TO GIVE

Principal Parts: *geben, gab, gegeben*

INDICATIVE	SUBJUNCTIVE
Present	*Present*
ich gebe, I give	*ich gebe,* I give
du giebst, thou givest	*du gebest,* thou give
er giebt, he gives	*er gebe,* he give
wir geben, we give	*wir geben,* we give
ihr gebt, you give	*ihr gebet,* you give
Sie geben, you give	*Sie geben,* you give
sie geben, they give	*sie geben,* they give
Imperfect	*Imperfect*
ich gab, I gave	*ich gäbe,* I gave
du gabst, thou gavest	*du gäbest,* thou gave
er gab, he gave	*er gäbe,* he gave
wir gaben, we gave	*wir gäben,* we gave
ihr gabt, you gave	*ihr gäbet,* you gave
Sie gaben, you gave	*Sie gäben,* you gave
sie gaben, they gave	*sie gäben,* they gave

IMPERATIVE

gieb, gebet, geben Sie, give

VERBAL PREFIXES

German verbs, like the English, are frequently compounded with prepositional particles, which have the force of modifying the meaning. There are, moreover, two varieties of prefixes, *separable* and *inseparable.* In German such prepositional particles are prefixed to the infinitive, but, according as they are separable or inseparable, they may be used, as in many of the English compound verbs, in a different part of the sentence, or remain prefixed to the verbal stem.

A very large number of English compound verbs are derived direct from the Latin, or from the Latin through the French. Thus, from the same Latin root we have "accede," "precede," "proceed," "intercede," "recede," "secede," "succeed," "exceed." All such prepositions are inseparable. We have from English roots, also, a number of compounds, like "bewail," "forego," "mislead," "outline," "overlook," "withstand," "upset," which are inseparable. Many such may be used separably, however, in which case a different meaning is assumed by the verb. Thus: "outlive" and "live out"; "overlook" and "look over"; "upset" and "set up," etc.

In studying this matter of verbal prefixes, we will discover that the same rule holds for both English and German: *separable* (or separated) *prefixes are accented; the inseparable are not.* Thus, in German, as in English, a number of particles may be used separably or inseparably, taking or missing the accent accordingly.

The following particles are always *separable; ab, an, auf, aus, bei, dar (da), ein, fort, her, hin, nach, nieder, ob, vor, weg, zu, zurück* and the compounds of *da, her, hin, vor—darunter, davon, heraus, herunter, herzu, hinauf, hinaus, hinein, voraus, vorbei, vorher, vorüber.*

Thus: from *anfangen,* "to begin," we have *er fängt an,* "he begins"; from *herauskommen,* "to come out," *nichts kommt heraus,* "nothing comes out [of it]." The separable prefix stands at the end of the clause with all the inflected parts of such verbs, except when standing in a dependent clause.

The particles *durch, hinter, über, um, unter, voll, wieder,* are separable when the accent rests on the particle, inseparable when it rests on the first syllable of the verb. In most cases the verb with one of these particles used inseparably has a figurative meaning. Thus:

durch'laufen, to run through
durchlau'fen, to peruse hastily

ü'bersetzen, to cross over
überse'tzen, to translate

um'gehen, to go round
umge'hen, to evade

un'terhalten, to hold under
unterhal'ten, to entertain

hin'tergehen, to go behind
hinterge'hen, to deceive

wie'derholen, to recover, recollect
wiederho'len, to repeat

The prefixes *be, emp, er, ge, ver, wider, zer,* are always inseparable; the prefix *mis,* almost always. The student should carefully discriminate between *wider,* "against," and *wieder,* "again," given in a previous list. Both are used inseparably.

It is important that the student carefully commit to memory the foregoing lists of prefixes, separable and inseparable, since several important rules govern their proper use with verbal roots.

FIRST, with all compound verbs the particle is always prefixed to the infinitives and participles, whether it be separable or inseparable in the other tenses. Thus:

Da ist in meinem herzen die Liebe aufgegangen.
Da hab' ich ihr gestanden.

The participle in the last sentence is derived from the verb *gestehen,* "to confess," not from *stehen,* "to stand."

SECOND, separable prefixes always precede the augment syllable *ge* of the past participle.

THIRD, inseparable prefixes are always prefixed directly to the perfect stem, the syllable *ge* being omitted. *Antworten,* "to answer," however, has its past participle *geantwortet.*

FOURTH, if a particle prefix may be used either separably or inseparably, as in the list of verbs given above, it is prefixed before *ge,* when separable, and takes the accent; and is prefixed direct to the stem of the perfect participle, omitting *ge,* the accent being thrown upon the first syllable of the root word.

Thus we have the principal parts with inseparables:

durchdri'ngen, durchdra'ng, durchdru'ngen, to penetrate
durchrei'sen, durchrei'ste, durchrei'st, to travel over
überfüh'ren, überfüh'rte, überfüh'rt, to convince
unterha'lten, unterhie'lt, unterha'lten, to entertain

Also the principal parts with separables:

du'rchdringen, drang du'rch, du'rchgedrungen, to press through a crowd, etc.
du'rchreisen, reiste du'rch, du'rchgereist, to travel through
überfürhen, führte über, übergeführt, to convey over
unterhalten, hielt unter, untergehalten, to hold under

In addition to the verbs with inseparable prefixes and those with separable prefixes used inseparably, all verbs whose present infinitive ends in *ieren,* as *marchieren,* omit the augment *ge* in the past participle.

Certain prefixes require certain cases in the noun to follow the verb. Thus, the prefix *be,* as in English, renders the verb transitive, even though its simple form be intransitive, or used with an indirect object. The same is true of verbs with *ver* and *zer,* although *vergeben, verzeihen,* and a few others, govern the dative, while *verblasen, verbleiben, verkehren,* and a number of others, are intransitive. Most verbs compounded with *ab, an, auf, aus, bei, ein, emp (ent), entgegen, mis, mit, nach, unter, vor, wider, zu,* govern the dative.

OUTLINES OF GERMAN SYNTAX

The uses of the verb in German are peculiar in a number of particulars, making it quite impossible to render a sentence directly from or into the English. All the idioms, however, are very simple, extremely regular, and by no means difficult to remember. It will be necessary for the student to master the rules thoroughly before attempting to form even the simplest sentences in German.

Perhaps the most difficult matters in the German verb relate to the use of the subjunctive mood, as this mood is all but obsolete in English. Since, in German the indicative mood is used only where statements of *positive, actual,* and *certain* facts are to be made, the subjunctive mood is most often used to express *uncertainty, contingency, doubt, possibility;* in general, matters on which the speaker does not wish to make an *unqualified statement.*

CONTINGENT ASSERTIONS. — In making statements beginning with "I think that"; "I believe that"; "I incline to think that"; "I assume that," etc., the verb of the English dependent clause should properly stand in the subjunctive mood, as in German. In the latter language, however, it is frequently the case that only the dependent clause is used, the main clause being *omitted* and *understood* (*logically*). Thus: *Ich wüste wohl* ("I may know well"), "I think I know"; *Ich dächte,* "I incline to think"; also, *dass ich wüsste,* "so far as I know."

WISHES AND COMMANDS are often expressed by the subjunctive in German, as in Latin and in classic English. Thus: *Wären mir nur Flügel gegeben,* "Were wings only given me"; *Das thue er nicht,* "Let him not do that"; *Lang lebe der König,* "Long live the king."

INDIRECT DISCOURSE is one of the more familiar uses of the subjunctive mood. As in English, the clause indirectly quoted is often introduced by the particles "that" (*dass*), "whether" (*ob*), etc., when, of course, the words take the transposed order. Thus: *Sie sagten, sie wüssten die Zeit nicht,* "They said they did not know the time"; *Ich riet ihm, dass er fleisiger werde,* "I advised him that he (to) become (be) more diligent"; *Frage ihn, ob er schon meinen Bruder gesehen habe,* "Ask him whether (if) he has seen my brother."

SEQUENCE OF TENSES.—The proper sequence of tenses, between the verbs of the main and dependent clauses, generally follows certain definite rules, although popular usage, as in English, allows some variations. Thus, the present or perfect subjunctive properly follow a past tense in the main clause, although the imperfect or pluperfect are often used, particularly when the form of the proper tense is the same as that of the indicative used in the main clause. To be brief, the rule demands the same tense of the subjunctive in indirect discourse that the indicative would take in the direct discourse, except where an assimilation takes place from the present to the past in ordinary narrations. Thus, in narrations, *Sie glaubten es wäre* (not *sei*) *Herr Schneider,* "They thought it was Mr. Schneider." But: *Sie glauben es wäre Herr Schneider.* The past tense rendering "It is," spoken in the past, gives "it was"; but the present tense, *quoting a present remark* about a past event, takes the same word. Thus, the German may use the present or past tense in the subjunctive, where the English generally gives only the past.

USES OF THE TENSES

THE PRESENT TENSE may be used where the English gives the perfect—as a form of "present anterior"—when the action, referred to past time, continues to the present in force or effect. Thus: *Ich sehe ihn nicht schon seit drei Monaten,* "I have not seen him for three months"; *Sind Sie schan lange in America?* "Have you been long in America?" But, in speaking of an action continuing to a certain definite past time, either the present or imperfect may be used. Thus: *Ich sah* (or *sehe*) *ihn nicht seit drei Monaten.*

THE PERFECT TENSE is frequently used for the English preterit, in the sense of simple past time; in referring to an action not necessarily habitual or continued; in stating a general truth. Thus: *Ich habe heute meinen Hund verloren,* "I lost my dog to-day"; *Gott hat die Welt erschaffen,* "God created the world"; *Vorige Woche bin ich in Boston gewesen,* "Last week I was in Boston," but *Vorige Woche war ich in Boston, als der Herr President das Stadthaus besuchte.* In the latter sentence the notion of continued action—"was visiting"—to be translated by the English progressive conjugation involves that the state of the first clause extends beyond a merely isolated point or period of past time. Hence the use of the imperfect in both clauses.

THE FUTURE TENSE expresses not only futurity, but also probability, as in the English "may." Thus: *Er wird dreizig Jahre alt sein,* "He may be thirty years old." Futurity is very often expressed by the present tense. Thus: *Morgen ist mein Geburtstag,* "To-morrow will be (is) my birthday"; *Morgen bin ich zwanzig Jahre alt,* "To-morrow I shall be (am) twenty years old." In very many such cases, however, the same idiom holds in English.

IN ATTEMPTING TO FORM SENTENCES in German, the student will soon find himself puzzled by the numerous departures from rules found in the "strong," or irregular, verbs, many of the most common of which he will find it necessary to commit to memory. Full lists of these verbs are given in most grammars and dictionaries.

MODAL TENSES

The use of the *modal auxiliaries,* or auxiliaries of mood, in German involves numerous rules, usages and idioms quite foreign to anything found in English.

In the first place, some of the corresponding words in English—such as "ought," "let," "permit," "intend," etc.—are followed by the infinitive with "to." This is contrary to German usage, since the preposition "to" never precedes the infinitive used with a modal auxiliary.

The *principal parts* of the modal auxiliaries are as follows:

können, konnte, gekonnt, be able
mögen, mochte, gemocht, may, might
müssen, musste, gemusst, must, be compelled
sollen, sollte, gesollt, ought, should, be obliged
wollen, wollte, gewollt, will, intend
dürfen, durfte, gedurft, be allowed
lassen, liess, gelassen, let, get to do

One peculiarity of the modal auxiliaries, most frequently of *müssen, wollen, sollen,* is that, with the infinitive of another verb, the compound tenses take the form of the present participle with *haben.* Thus: *ich habe—sollen; ich habe—müssen; ich habe —wollen,* etc., as in the following sentences:

Am Ende, er hat die Aufgabe lernen müssen, "In the end, he was obliged to learn his lesson."

Wir haben heute Morgen Briefe schreiben sollen, "We ought to have written letters this morning."

THE AUXILIARIES OF MODE

THE AUXILIARY "MÜSSEN" (MUST), TO BE OBLIGED, TO HAVE TO

Principal Parts: *müssen, musste, gemusst*

INDICATIVE

Present

ich muss, I must, am obliged
du musst, thou must
er muss, he must
wir müssen, we must
ihr müsst, you must
Sie müssen, you must
sie müssen, they must

Imperfect

ich musste, I was obliged
du musstest, thou wast obliged
er musste, he was obliged
wir mussten, we were obliged
ihr musstet, you were obliged
Sie mussten, you were obliged
sie mussten, they were obliged

Future

ich werde müssen, I shall be obliged
du wirst müssen, thou wilt be obliged, etc.

Perfect

ich habe gemusst or *müssen,* I have been obliged
du hast gemusst or *müssen,* etc.

Pluperfect

ich hatte gemusst or *müssen,* I had been obliged
du hattest gemusst or *müssen,* etc.

SUBJUNCTIVE

Present

ich müsse, (that) I must, be obliged
du müssest, thou must
er müsse, he must
wir müssen, we must
ihr müsset, you must
Sie müssen, you must
sie müssen, they must

Imperfect

ich müsste, I were obliged
du müsstest, thou wert obliged
er müsste, he were obliged
wir müssten, we were obliged
ihr müsstet, you were obliged
Sie müssten, you were obliged
sie müssten, they were obliged

Future

ich werde müssen, (that) I shall be obliged
du werdest müssen, thou wilt be obliged, etc.

Perfect

ich habe gemusst or *müssen,* (that) I have been obliged
du habest gemusst or *müssen,* etc.

Pluperfect

ich hätte gemusst or *müssen,* (that) I had been obliged
du hättest gemusst or *müssen,* etc.

INFINITIVES

Present

müssen, to be obliged

Perfect

gemusst haben or *haben müssen,* to have been obliged

PARTICIPLES

Present

müssend, being obliged

Past

gemusst or *müssen,* been obliged

The other compound tenses are conjugated like verbs with the auxiliary *haben,* except for the peculiar construction common to the use of the perfect participle constructions with these verbs.

THE AUXILIARY "KÖNNEN" (CAN), TO BE ABLE

Principal Parts: *können, konnte, gekonnt*

INDICATIVE

Present

ich kann, I can, am able
du kannst, thou canst
er kann, he can
wir können, we can
ihr könnt, you can
Sie können, you can
sie können, they can

Imperfect

ich konnte, I could, was able
du konntest, thou couldst
er konnte, he could
wir konnten, we could
ihr konntet, you could
Sie konnten, you could
sie konnten, they could

SUBJUNCTIVE

Present

ich könne, (that) I can, be able
du könnest, thou canst
er könne, he can
wir können, we can
ihr könnet, you can
Sie können, you can
sie können, they can

Imperfect

ich könnte, I could, were able
du könntest, thou couldst
er könnte, he could
wir könnten, we could
ihr könntet, you could
Sie könnten, you could
sie könnten, they could

THE AUXILIARY "WOLLEN" (WILL), TO BE WILLING (TO WISH, TO LIKE)

Principal Parts: *wollen, wollte, gewollt*

INDICATIVE

Present

ich will, I will, am willing
du willst, thou wilt
er will, he will
wir wollen, we will
ihr wollt, you will
Sie wollen, you will
sie wollen, they will

Imperfect

ich wollte, I would, was willing
du wolltest, thou wouldst
er wollte, he would
wir wollten, we would
ihr wolltet, you would
Sie wollten, you would
sie wollten, they would

SUBJUNCTIVE

Present

ich wolle, (that) I will, be willing
du wollest, thou wilt
er wolle, he will
wir wollen, we will
ihr wollet, you will
Sie wollen, you will
sie wollen, they will

Imperfect

ich wollte, (that) I would, were willing
du wolltest, thou wouldst
er wollte, he would
wir wollten, we would
ihr wolltet, you would
Sie wollten, you would
sie wollten, they would

THE AUXILIARY "SOLLEN," SHALL (OBLIGATORY), OUGHT

Principal Parts: *sollen, sollte, gesollt*

INDICATIVE

Present

ich soll, I shall, am to
du sollt, thou shalt
er soll, he shall
wir sollen, we shall
ihr sollt, you shall
Sie sollen, you shall
sie sollen, they shall

SUBJUNCTIVE

Present

ich solle, (that) I shall
du sollest, thou shalt
er solle, he shall
wir sollen, we shall
ihr sollet, you shall
Sie sollen, you shall
sie sollen, they shall

The imperfects, indicative and subjunctive, are like those of *wollen.*

THE AUXILIARY "DÜRFEN," TO BE ALLOWED (TO DARE)

Principal Parts: *dürfen, durfte, gedurft*

INDICATIVE

Present

ich darf, I am allowed
du darfst, thou art allowed
er darf, he is allowed
wir dürfen, we are allowed
ihr dürft, you are allowed
Sie dürfen, you are allowed
sie dürfen, they are allowed

Imperfect

ich durfte, I was allowed
du durftest, thou wast allowed
er durfte, he was allowed
wir durften, we were allowed
ihr durftet, you were allowed
Sie durften, you were allowed
sie durften, they were allowed

SUBJUNCTIVE

Present

ich dürfe, I be allowed
du dürfest, thou be allowed
er dürfe, he be allowed
wir dürfen, we be allowed
ihr dürfet, you be allowed
Sie dürfen, you be allowed
sie dürfen, they be allowed

Imperfect

ich dürfte, I were allowed
du dürftest, thou wert allowed
er dürfte, he were allowed
wir dürften, we were allowed
ihr dürftet, you were allowed
Sie dürften, you were allowed
sie dürften, they were allowed

THE AUXILIARY "MÖGEN" (MAY), TO LIKE

Principal Parts: *mögen, mochte, gemocht*

INDICATIVE

Present

ich mag, I may, like
du magst, thou mayest
er mag, he may
wir mögen, we may
ihr mögt, you may
Sie mögen, you may
sie mögen, they may

Imperfect

ich mochte, I liked
du mochtest, thou likedst
er mochte, he liked
wir mochten, we liked
ihr mochtet, you liked
Sie mochten, you liked
sie mochten, they liked

SUBJUNCTIVE

Present

ich möge, (that) I may, like
du mögest, thou mayest
er möge, he may
wir mögen, we may
ihr möget, you may
Sie mögen, you may
sie mögen, they may

Imperfect

ich möchte, (that) I might, liked
du möchtest, thou mightest
er möchte, he might
wir möchten, we might
ihr möchtet, you might
Sie möchten, you might
sie möchten, they might

THE CAUSATIVE AUXILIARY "LASSEN," TO LET, TO LEAVE (TO HAVE DONE)

Principal Parts: *lassen, liess, gelassen*

INDICATIVE	SUBJUNCTIVE
Present	*Present*
I let	I may let
ich lasse	*ich lasse*
du lässest	*du lassest*
er lässt	*er lasse*
wir lassen	*wir lassen*
ihr lasset	*ihr lasset*
sie lassen	*sie lassen*
Imperfect	*Imperfect*
ich liess	*ich liesse*
Perfect	*Perfect*
ich habe gelassen	*ich habe gelassen*
Pluperfect	*Pluperfect*
ich hatte gelassen	*ich hätte gelassen*
Future	*Future*
ich werde lassen	*ich werde lassen*
Future Perfect	*Future Perfect*
ich werde gelassen haben	*ich werde gelassen haben*

FIRST CONDITIONAL

ich würde lassen

SECOND CONDITIONAL

ich würde gelassen haben

IMPERATIVE

lass er
lass du
lassen wir
lasset ihr
lassen sie

SYNTAX OF THE MODAL AUXILIARIES

The uses and meanings of the modal auxiliaries are numerous, and far more inclusive than those of their English equivalents. In fact, the equivalents given in the above lists and paradigms represent only a small portion of the meanings actually belonging to them. To be perfectly precise, we will take each verb in turn, giving a list of the meanings commonly attached to it; then arrange sentences under the English equivalents. Thus:

THE AUXILIARY *müssen* signifies generally *moral necessity,* occasionally, also *physical necessity.*

THE AUXILIARY *können,* on the other hand, denotes (a) *physical possibility;* (b) it is used in the sense of the English "may," as indicating a *possibility* or *probability* admitted by a speaker; (c) it has the force of "know" or "able to speak," in sentences referring to languages, as, *ich kann nicht Englisch,* "I can not speak English."

THE AUXILIARY *mögen* expresses (a) permission or lack of objection to an action; (b) a possibility granted in speaking; (c) inclination or liking; (d) wishing.

THE AUXILIARY *wollen* expresses (a) desire, design, or intent; (b) with *eben,* immediate future action, *being about to act;* meaning or significance.

THE AUXILIARY *sollen* expresses (a) moral obligation, duty; (b) significance or value; (c) contingent possibility, in the sense of "would"; (d) allegation, in the sense of "it is said"; (e) *destiny*, in the sense of "should," "was to"; (f) *chance*, in the sense of "should"; (g) by ellipsis, *should*, with an infinitive ("do," etc.) understood.

THE AUXILIARY *dürfen* expresses (a) obligation; (b) allowance, or permission; (c) venturing or daring in the moral sense; (d) as the English "need" in "You need not complain," *Sie dürfen nicht darüber klagen;* (e) admitted probability or possibility.

THE CAUSATIVE AUXILIARY *lassen* signifies (a) to let, allow, permit; (b) to leave; (c) to have or get (before an infinitive); (d) to cause, to order (before an active infinitive); (e) "let," as an auxiliary imperative, as in *lasst uns singen und tanzen*, "Let us sing and dance"; (f) "may" or "can" with the reflective pronoun *sich*.

In its use as causative auxiliary it supplies the place of the English phrase "have done." Thus: "I have had a pair of shoes made." *Ich habe ein Paar Schuhe machen lassen.*

IDIOMATIC USES OF THE MODAL AUXILIARIES

In learning the principles of the German language, it is necessary to fully understand how to express a number of ideas, used in English with proper verbal auxiliaries or with general verbs used in an auxiliary manner.

Prominent among these meanings, as we have already learned, are *can, could, do* (auxiliary and emphatic), *know, let, like, may, mean, might, must, need, ought, pretend, "said to be," shall, should, want, will, wish, would.* As most of these may be expressed by two or more German auxiliaries, the following lists of modal idioms will be arranged under the English equivalents.

I. CAN, COULD

I can do it. *Ich kann es thun.*
How can I help it? *Was kann ich dafür?*
I can do nothing else. *Ich kann nicht anders.*
I can speak German. *Ich kann Deutsch.*
I can not help laughing. *Ich muss lachen.*
Who can it have been? *Wer muss es gewesen sein?*
He can not be there. *Er muss noch nicht da sein.*
What can (am I to) do? *Was soll ich?*
How could that be possible? *Wie sollte das möglich sein?*
Can that be true. *Sollte das wahr sein?*

II. Do (auxiliary emphatic)

What do you mean by that? *Was wollen Sie damit sagen?*
That does not quite please me. *Das will mir nicht recht gefallen.*

III. LET (Allow, Permit)

I let him alone. *Ich lasse ihn stehen.*
We let the children sleep. *Wir lassen die Kinder schlafen.*
Let us take a cup of coffee. *Lassen Sie uns eine Tasse Kaffee trinken.*
Let him take care. *Er mag sich in Acht nehmen.*

IV. LIKE (Incline, Care)

He does not like to drink wine. *Er mag keinen Wein trinken.*
I should have liked to see him. *Ich hätte ihn sehen mögen.*
I should like to know. *Ich möchte gern wohl wissen.*
I incline (almost) to think. *Fast mochte das nicht glauben.*
I did not like to do it. *Ich habe es nicht thun mögen.*

V. MAY

You may come in. *Du kannst herein kommen.*
He may be a German. *Er kann ein Deutscher sein.*
You may read the letter. *Sie mögen den Brief lesen.*
It may be true. *Es mag wahr sein.*
This question may possibly be superfluous. *Diese Frage dürfte wohl überflüssig sein.*
May I ask? *Darf ich fragen.*
He may have forgotten that. *Er dürfte das vergessen haben. Er kann das vergessen haben.*
It may be three months already. *Es mögen jetzt drei Monaten sein.*
It may be as you say. *Es mag sein wie du sagst.*

VI. MEAN

What does it mean? *Was soll das?*
What is it (does it mean) to me? *Was soll mir das?*
What do you mean by that? *Was wollen Sie damit sagen?*

VII. MIGHT

Might it not be too late? *Dürfte es nicht zu spät sein.*
That might be dangerous. *Das könnte gefährlich sein.*

VIII. MUST

It must (needs) be so. *Es muss nun einmal so sein.*
He must be sick. *Er muss wohl krank sein.*
If it must be so. *Wenn es sein soll.*

IX. NEED

He needs but to command. *Er darf nur befehlen.*
You need not complain. *Sie durften nicht darüber klagen.*

X. OUGHT

He ought to pay his debts. *Er sollte seine Schulden bezahlen.*
I ought to have gone. *Ich hätte gehen sollen.*

XI. PRETEND (Profess)

He pretends to have known us. *Er will uns bekannt haben.*

XII. "SAID TO BE"

He is said to be very poor. *Er soll sehr arm sein.*
This (statue or picture) is said to be Mr. Smith. *Dies soll Herr Smith sein.*

XIII. SHALL, WILL (about to be)

He was about to go out. *Er wollte eben ausgehen.*
He is about to speak. *Er will eben sprechen,* or *Er ist im Begriff zu sprechen.*
Where are you going? *Wo wollen Sie hin?*
You shall smart for it. *Du sollst es empfinden.*
He was about (destined) to experience a greater misfortune. *Er sollte ein grösseres Unglück erleben.*

XIV. SHOULD (Would)

I should like to know. *Ich möchte gern wohl wissen.*
I should prefer. *Ich möchte gern—lieber.*
One would think. *Man sollte meinen.*

XV. TELL (Bid)

He told the messenger to wait outside. *Er lies den Boten draussen warten.*

Among other modal idioms, the following may be mentioned as expressions of wish, etc., such as: Please God. *Wills Gott.*—God forbid it. *Das wolle nicht Gott.*—Would God it were true. *Wollte Gott es wäre wahr.*

STRONG AND MIXED VERBS

There are seven classes of irregular verbs in German:

(1) Those changing radical *e* into *a* in the imperfect indicative and resuming it in the past participle; as, *geben, gab, gegeben.*

(2) Those changing radical *e* or *i* to *a* in the imperfect indicative, and into *o* in the past participle; as, *nehmen, nahm, genommen* and *gewinnen, gewann, gewonnen.*

(3) Those changing radical *i* into *a* in the imperfect and into *u* in the past participle; as, *schlingen, schlang, geschlungen.*

(4) Those changing radical *a* into *ie* in the imperfect and resuming it in the past participle; as, *halten, hielt, gehalten.*

(5) Those changing radical *ei* into *ie* in both imperfect and past participle, but into *i* before a double consonant; as, *bleiben, blieb, geblieben.*

(6) Those changing radical *a, au, e, i, ie, ö, ü,* into *o* in the imperfect and past participle.

(7) Those changing radical *a* into *u* in the imperfect; as, *wachsen, wuchs, gewachsen.*

EXPLANATION.—Compounds are not included in this list, unless the simple verb is not in use. The letters (h) and (s) signify that the auxiliary is *haben* or *sein.* Where a tense is regular, it is omitted from the list.

The principal irregularities occur in the present indicative (1), the imperfect indicative (2), the imperfect subjunctive (3), and the past participle (4), as shown in the following list.

When there are three forms under (1), the first, second, and third persons are indicated; when only two, the second and third. Two forms under (2) and (3) indicate variations of the first person singular.

BACKEN, (h), *bake,* (1) bäckst, bäckt; (2) buk; (3) büke; (4) gebacken.

BEFEHLEN, (h), *command,* (1) befiehlst, befiehlt; (2) befahl; (3) befähle, beföhle; (4) befohlen.

BEFLEISSEN, (h), *apply,* (2) befliss; (3) beflisse; (4) beflissen.

BEGINNEN, (h), *begin,* (2) begann; (3) begänne, begönne; (4) begonnen.

BEISSEN, (h), *bite,* (2) biss; (3) bisse; (4) gebissen.

BERGEN, (h), *hide,* (1) birgst, birgt; (2) barg; (3) bärge, bürge; (4) geborgen.

BERSTEN, (s), *burst,* (1) birstest, birst; (2) barst, borst; (3) bärste, börste; (4) geborsten.

BEWEGEN, (h), *induce,* (2) bewog; (3) bewöge; (4) bewogen.

BIEGEN, (h *and* s), *bend,* (2) bog; (3) böge; (4) gebogen.

BIETEN, (h), *offer,* (1) beutst, beut; (2) bot; (3) böte; (4) geboten.

BINDEN, (h), *bind,* (2) band; (3) bände; (4) gebunden.

BITTEN, (h), *beg,* (2) bat; (3) bäte; (4) gebeten.

BLASEN, (h), *blow,* (1) bläsest, bläst; (2) blies; (3) bliese; (4) geblasen.

BLEIBEN, (s), *remain,* (2) blieb; (3) bliebe; (4) geblieben.

BLEICHEN, (h), *bleach,* (2) blich; (3) bliche; (4) geblichen.

BRATEN, (h), *roast,* (1) brätst, brät; (2) briet; (3) briete; (4) gebraten.

BRECHEN, (h *and* s), *break,* (1) brichst, bricht; (2) brach; (3) bräche; (4) gebrochen.

BRENNEN, (h), *burn,* (2) brannte; (3) brennte; (4) gebrannt.

BRINGEN, (h), *bring,* (2) brachte; (3) brächte; (4) gebracht.

DENKEN, (h), *to think,* (2) ich dachte; (3) ich dächte; (4) gedacht.

DINGEN, (h), *to bargain, hire,* (2) ich dung; (3) ich dünge; (4) gedungen.

DRESCHEN, (h), *to thrash,* (1) du drischest, er drischt; (2) ich drosch (drasch); (3) ich drösche (dräsche); (4) gedroschen.

DRINGEN, (s), *to urge, insist,* (2) ich drang; ich dränge; (4) gedrungen.

DÜRFEN, (h), *to be permitted,* (1) ich darf, du darfst, er darf; (2) ich durfte; (3) ich dürfte; (4) gedurft.

ESSEN, (h), *to eat,* (1) du issest, er isset, *or* isst; (2) ich ass; (3) ich ässe; (4) gegessen.

FAHREN, (s), *to drive,* (1) du fährst, er fährt; (2) ich fuhr; (3) ich führe; (4) gefahren.

FALLEN, (s), *to fall,* (1) du fällst, er fällt; (2) ich fiel; (3) ich fiele; (4) gefallen.

FANGEN, (h), *to take, catch,* (1) du fängst, er fängt; (2) ich fing; (3) ich finge; (4) gefangen.

FECHTEN, (h), *to fight,* (1) du fichtst, er ficht; (2) ich focht; (3) ich föchte; (4) gefochten.

FINDEN, (h), *to find,* (2) ich fand; (3) ich fände; (4) gefunden.

FLECHTEN, (h), *to plait,* (1) du flichtst, er flicht; (2) ich flocht; (3) ich flöchte; (4) geflochten.

FLIEGEN, (s), *to fly, soar,* (1) reg. or: du fleugst, er fleugt; (2) ich flog; (3) ich flöge; (4) geflogen.

FLIEHEN, (s), *to flee,* (1) reg. or: du fleuchst, er fleucht; (2) ich floh; (3) ich flöhe; (4) geflohen.

FLIESSEN, (s *and* h), *to drop, flow,* (1) reg. or: fleussest, er fleusst; (2) ich floss; (3) ich flösse; (4) geflossen.

FRAGEN, (h), *to ask,* (1) du frägst, er frägt; (2) ich frug; (3) ich früge.

FRESSEN, (h), *to eat voraciously,* (1) du frissest, er frisst; (2) ich frass; (3) ich frässe; (4) gefressen.

FRIEREN, (s *and* h), *to freeze,* (2) ich fror; (3) ich fröre; (4) gefroren.

GÄHREN, (s *and* h), *to ferment,* (2) ich gohr; (3) ich göhre; (4) gegohren.

GEBÄREN, (h), *to produce, to bear,* (1) du gebierst, er gebiert; (2) ich gebar; (3) ich gebäre; (4) geboren.

GEBEN, (h), *to give,* (1) du giebst (gibst), er giebt (gibt); (2) ich gab; (3) ich gäbe; (4) gegeben.

GEDEIHEN, (s), *thrive,* (2) gedieh; (3) gediehe; (4) gediehen.

GEHEN, (s), *go,* (2) ging; (3) ginge; (4) gegangen.

GELINGEN, (s), *succeed,* (2) gelang; (3) gelänge; (4) gelungen.

GELTEN, (h), *be worth,* (1) giltst, gilt; (2) galt; (3) gälte, gölte; (4) gegolten.

GENESEN, (s), *recover,* (2) genas; (3) genäse; (4) genesen.

GENIESSEN, (h), *enjoy,* (2) genoss; (3) genösse; (4) genossen.

GESCHEHEN, (s), *happen,* (1) geschieht; (2) geschah; (3) geschähe; (4) geschehen.

GEWINNEN, (h), *gain,* (2) gewann; (3) gewänne, gewönne; (4) gewonnen.

GIESSEN, (h), *pour,* (1) geussest, geusst; (2) goss; (3) gösse; (4) gegossen.

GLEICHEN, (h), *resemble,* (2) glich; (3) gliche; (4) geglichen.

GLEITEN, (s *and* h), *glide,* (2) glitt; (3) glitte; (4) geglitten.

GLIMMEN, (h), *gleam,* (2) glomm; (3) glömme; (4) geglommen.

GRABEN, (h), *dig,* (1) gräbst, gräbt; (2) grub; (3) grübe; (4) gegraben.

GREIFEN, (h), *gripe,* (2) griff; (3) griffe; (4) gegriffen.

HABEN, (h), *have,* (1) hast, hat; (2) hatte; (3) hätte; (4) gehabt.

HALTEN, (h), *hold,* (1) hältst, hält; (2) hielt; (3) hielte; (4) gehalten.

HANGEN, (h), *hang,* (1) hängst, hängt; (2) hing, hieng; (3) hinge, hienge; (4) gehangen.

HAUEN, (h), *hew,* (2) hieb; (3) hiebe; (4) gehauen.

HEBEN, (h), *raise,* (2) hob, hub; (3) höbe, hübe; (4) gehoben.

HEISSEN, (h), *call,* (2) hiess; (3) hiesse; (4) geheissen.

HELFEN, (h), *help,* (1) hilfst, hilft; (2) half; (3) hälfe, hülfe; (4) geholfen.

KEIFEN, (h), *chide,* (2) kiff; (3) kiffe; (4) gekiffen.

KENNEN, (h), *know,* (2) kannte; (3) kennte; (4) gekannt.

KLIEBEN, (h *and* s), *cleave,* (2) klob; (3) klöbe; (4) gekloben.

KLIMMEN, (h *and* s), *climb,* (2) klomm; (3) klömme; (4) geklommen.

KLINGEN, (h), *sound,* (2) klang; (3) klänge, klünge; (4) geklungen.

KNEIFEN, (h), *pinch,* (2) kniff; (3) kniffe; (4) gekniffen.

KNEIPEN, (h), *pinch,* (2) knipp; (3) knippe; (4) geknippen.

KOMMEN, (s), *come,* (2) kam; (3) käme; (4) gekommen.

KÖNNEN, (h), *can,* (1) kann, kannst, kann; (2) konnte; (3) könnte; (4) gekonnt.

KRIECHEN, (h *and* s), *creep,* (2) kroch; (3) kröche; (4) gekrochen.

KÜREN, (h), *choose,* (2) kor; (3) köre; (4) gekoren.

LADEN, (h), *load, invite,* (1) lädst, lädt; (2) lud; (3) lüde; (4) geladen.

LASSEN, (h), *let,* (1) lässest, lässt; (2) liess; (3) liesse; (4) gelassen.

LAUFEN, (s *and* h), *run,* (1) läufst, läuft; (2) lief; (3) liefe; (4) gelaufen.

LEIDEN, (h), *suffer,* (2) litt; (3) litte; (4) gelitten.

LEIHEN, (h), *lend,* (2) lieh; (3) liehe; (4) geliehen.

LESEN, (h), *read,* (1) liesest, liest; (2) las; (3) läse; (4) gelesen.

LIEGEN, (h), *lie,* (2) lag; (3) läge; (4) gelegen.

LÖSCHEN, (h), *go out,* (1) lischest, lischt; (2) losch; (3) lösche; (4) geloschen.

LÜGEN, (h), *tell a lie,* (2) log; (3) löge; (4) gelogen.

MAHLEN, (h), *grind,* (2) muhl; (3) mühle; (4) gemahlen.

MEIDEN, (h), *shun,* (2) mied; (3) miede; (4) gemieden.

MELKEN, (h), *milk,* (2) molk; (3) mölke; (4) gemolken.

MESSEN, (h), *measure,* (1) missest, misst; (2) mass; (3) mässe; (4) gemessen.

MISLINGEN, (s), *fail,* (2) mislang; (3) mislänge; (4) mislungen.

MÖGEN, (h), *may,* (1) mag, magst, mag; (2) mochte; (3) möchte; (4) gemocht.

MÜSSEN, (h), *must,* (1) muss, musst, muss; (2) musste; (3) müsste; (4) gemusst.

NEHMEN, (h), *take,* (1) nimmst, nimmt; (2) nahm; (3) nähme; (4) genommen.

NENNEN, (h), *name,* (2) nannte; (3) nennte; (4) genannt.

PFEIFEN, (h), *whistle,* (2) pfiff; (3) pfiffe; (4) gepfiffen.

PFLEGEN, (h), *cherish,* (2) pflog, pflag; (3) pflöge; (4) gepflogen.

PREISEN, (h), *praise,* (2) pries; (3) priese; (4) gepriesen.

QUELLEN, (s *and* h), *gush,* (1) quillst, quillt; (2) quoll; (3) quölle; (4) gequollen.

RÄCHEN, (h), *avenge,* (2) roch; (3) röche; (4) gerochen.

RAT(H)EN, (h), *advise,* (1) rät(h)st, rät(h); (2) riet(h); (3) riet(h)e; (4) gerat(h)en.

REIBEN, (h), *rub,* (2) rieb; (3) riebe; (4) gerieben.

REISSEN, (h *and* s), *tear,* (2) riss; (3) risse; (4) gerissen.

REITEN, (s *and* h), *ride,* (2) ritt; (3) ritte; (4) geritten.

RENNEN, (s *and* h), *run,* (2) rannte; (3) rennte; (4) gerannt.

RIECHEN, (h), *smell,* (2) roch; (3) röche; (4) gerochen.

RINGEN, (h), *wring,* (2) rang; (3) ränge; (4) gerungen.

RINNEN, (s *and* h), *run,* (2) rann; (3) ränne, rönne; (4) geronnen.

RUFEN, (h), *call,* (2) rief; (3) riefe; (4) gerufen.

SAUFEN, (h), *drink,* (1) säufst, säuft; (2) soff; (3) söffe; (4) gesoffen.

SAUGEN, (h), *suck,* (2) sog; (3) söge; (4) gesogen.

SCHAFFEN, (h), *create,* (2) schuf; (3) schüfe; (4) geschaffen.

SCHALLEN, (h), *sound,* (2) schöll; (3) schölle; (4) geschollen.

SCHEIDEN, (s *and* h), *part,* (2) schied; (3) schiede; (4) geschieden.

SCHEINEN, (h), *appear,* (2) schien; (3) schiene; (4) geschienen.

SCHELTEN, (h), *scold,* (1) schiltst, schilt; (2) schalt; (3) schälte, schölte; (4) gescholten.

SCHEREN, (h), *shear,* (1) schierst, schiert; (2) schor; (3) schöre; (4) geschoren.

SCHIEBEN, (h *and* s), *shove,* (2) schob; (3) schöbe; (4) geschoben.

SCHIESSEN, (h), *shoot,* (2) schoss; (3) schösse; (4) geschossen.

SCHINDEN, (h), *flay,* (2) schund; (3) schünde; (4) geschunden.

SCHLAFEN, (h), *sleep,* (1) schläfst, schläft; (2) schlief (3) schliefe; (4) geschlafen.

SCHLAGEN, (h *and* s), *strike,* (1) schlägst, schlägt; (2) schlug; (3) schlüge; (4) geschlagen.

SCHLEICHEN, (s *and* h), *sneak,* (2) schlich; (3) schliche; (4) geschlichen.

SCHLEIFEN, (h *and* s), *grind,* (2); schliff; (3) schliffe; (4) geschliffen.

SCHLEISSEN, (h *and* s), *slit,* (2) schliss; (3) schlisse; (4) geschlissen.

SCHLIEFEN, (s), *slip,* (2) schloff; (3) schlöffe; (4) geschloffen.

SCHLIESSEN, (h), *shut,* (2) schloss; (3) schlösse; (4) geschlossen.

SCHLINGEN, (h), *sling,* (2) schlang; (3) schlänge; (4) geschlungen.

SCHMEISSEN, (h), *smite,* (2) schmiss; (3) schmisse; (4) geschmissen.

SCHMELZEN, (s), *melt,* (1) schmilzest, schmilzt; (2) schmolz; (3) schmölze; (4) geschmolzen.

SCHNAUBEN, (h), *snort,* (2) schnob; (3) schnöbe; (4) geschnoben.

SCHNEIDEN, (h), *cut,* (2) schnitt; (3) schnitte; (4) geschnitten.

SCHRAUBEN, (h), *screw,* (2) schrob; (3) schröbe; (4) geschroben.

SCHRECKEN, (s), *be afraid,* (1) schrickst, schrickt; (2) schrak; (3) schräke; (4) geschrocken.

SCHREIBEN, (h), *write,* (2) schrieb; (3) schriebe; (4) geschrieben.

SCHREIEN, (h), *cry,* (2) schrie; (3) schriee; (4) geschrieen.

SCHREITEN, (s), *stride,* (2) schritt; (3) schritte; (4) geschritten.

SCHWÄREN, (h *and* s), *ulcerate,* (2) schwor; (3) schwöre; (4) geschworen.

SCHWEIGEN, (h), *be silent,* (2) schwieg; (3) schwiege; (4) geschwiegen.

SCHWELLEN, (s *and* h), *swell,* (1) schwillst, schwillt; (2) schwoll; (3) schwölle; (4) geschwollen.

SCHWIMMEN, (s *and* h), *swim,* (2) schwamm, schwomm; (3) schwämme, schwömme; (4) geschwommen.

SCHWINDEN, (s), *vanish,* (2) schwand, schwund; (3) schwände, schwünde; (4) geschwunden.

SCHWINGEN, (h), *swing,* (2) schwang, schwung; (3) schwänge, schwünge; (4) geschwungen.

SCHWÖREN, (h), *swear,* (2) schwor, schwur; (3) schwöre, schwüre; (4) geschworen.

SEHEN, (h), *see,* (1) siehst, sieht; (2) sah; (3) sähe; (4) gesehen.

SEIN, (s), *be,* (1) bin, bist, ist; (2) war; (3) wäre; (4) gewesen.

SENDEN, (h), *send,* (2) sandte, sendete; (3) sendete; (4) gesandt, gesendet.

SIEDEN, (h), *boil,* (2) sott; (3) siedete; (4) gesotten.

SINGEN, (h), *sing,* (2) sang; (3) sänge; (4) gesungen.

SINKEN, (s), *sink,* (2) sank; (3) sänke; (4) gesunken.

SINNEN, (*h* and *s*), *think,* (2) sann; (3) sänne, sönne; (4) gesonnen.

SITSEN, (h), *sit,* (2) sass; (3) sässe; (4) gesessen.

SOLLEN, (h), *should,* (1) soll, sollst, soll; (2) sollte; (3) sollte; (4) gesollt.

SPEIEN, (h), *spit,* (2) spie; (3) spiee; (4) gespieen.

SPINNEN, (h), *spin,* (2) spann; (3) spänne, spönne; (4) gesponnen.

SPLEISSEN, (h *and* s), *split,* (2) spliss; (3) splisse; (4) gesplissen.

SPRECHEN, (h), *speak,* (1) sprichst, spricht; (2) sprach; (3) spräche; (4) gesprochen.

SPRIESSEN, (s *and* h), *sprout,* (2) spross; (3) sprösse; (4) gesprossen.

SPRINGEN, (s *and* h), *spring,* (2) sprang; (3) spränge; (4) gesprungen.

STECHEN, (h), *prick,* (1) stichst, sticht; (2) stach; (3) stäche; (4) gestochen.

STECKEN, (h), *stick,* (2) stak; (3) stäke; (4) gestochen.

STEHEN, (h *and* s), *stand,* (2) stand, stund; (3) stände, stünde; (4) gestanden.

STEHLEN, (h), *steal,* (1) stiehlst, stiehlt; (2) stahl; (3) stähle; (4) gestohlen.

STEIGEN, (s *and* h), *ascend,* (2) stieg; (3) stiege; (4) gestiegen.

STERBEN, (s), *die,* (1) stirbst, stirbt; (2) starb; (3) stärbe, stürbe; (4) gestorben.

STIEBEN, (h *and* s), *disperse,* (2) stob; (3) stöbe; (4) gestoben.

STINKEN, (h), *stink,* (2) stank, stunk; (3) stänke, stünke; (4) gestunken.

STOSSEN, (h *and* s), *push,* (1) stössest, stösst; (2) stiess; (3) stiesse; (4) gestossen.

STREICHEN, (h), *stroke,* (2) strich; (3) striche; (4) gestrichen.

STREITEN, (h), *strive,* (2) stritt; (3) stritte; (4) gestritten.

THUN, (h), *do,* (2) that; (3) thäte; (4) gethan.

TRAGEN, (h), *carry,* (1) trägst, trägt; (2) trug; (3) trüge, (4) getragen.

TREFFEN, (h), *hit,* (1) triffst, trifft; (2) traf; (3) träfe; (4) getroffen.

TREIBEN, (h *and* s), *drive,* (2) trieb; (3) triebe; (4) getrieben.

TRETEN, (h *and* s), *tread,* (1) trittst, tritt; (2) trat; (3) träte; (4) getreten.

TRIEFEN, (h *and* s), *drip,* (2) troff; (3) tröffe; (4) getroffen.

TRINKEN, (h), *drink,* (2) trank; (3) tränke; (4) getrunken.

TRÜGEN, (h), *deceive,* (2) trog; (3) tröge; (4) getrogen.

VERDERBEN, (s *and* h), *spoil,* (1) verdirbst, verdirbt; (2) verdarb; (3) verdärbe, verdürbe; (4) verdorben.

VERDRIESSEN, (h), *vex,* (2) verdross; (3) verdrösse; (4) verdrossen.

VERGESSEN, (h), *forget,* (1) vergissest, vergisst; (2) vergass; (3) vergässe; (4) vergessen.

VERLIEREN, (h), *lose,* (2) verlor; (3) verlöre; (4) verloren.

WACHSEN, (s), *grow,* (1) wächsest, wächst; (2) wuchs; (3) wüchse; (4) gewachsen.

WÄGEN, (h), *weigh,* (2) wog; (3) wöge; (4) gewogen.

WASCHEN, (h), *wash,* (1) wäschest, wäscht; (2) wusch; (3) wüsche; (4) gewaschen.

WEBEN, (h), *weave,* (2) wob; (3) wöbe; (4) gewoben.

WEICHEN, (s *and* h), *yield,* (2) wich; (3) wiche; (4) gewichen.

WEISEN, (h), *show,* (2) wies; (3) wiese; (4) gewiesen.

WENDEN, (h), *turn,* (2) wandte, wendete; (3) wendete; (4) gewandt, gewendet.

WERBEN, (h), *sue,* (1) wirbst, wirbt; (2) warb; (3) wärbe, würbe; (4) geworben.

WERDEN, (s), *become,* (1) wirst, wird; (2) ward, wurde; (3) würde; (4) geworden.

WERFEN, (h), *throw,* (1) wirfst, wirft; (2) warf; (3) wärfe, würfe; (4) geworfen.

WIEGEN, (h), *weigh,* (2) wog; (3) wöge; (4) gewogen.

WINDEN, (h), *wind,* (2) wand; (3) wände; (4) gewunden.

WISSEN, (h), *know,* (1) weiss, weisst, weiss; (2) wusste; (3) wüsste; (4) gewusst.

WOLLEN, (h), *will,* (1) will, willst, will; (2) wollte; (3) wollte; (4) gewollt.

ZEIHEN, (h), *accuse,* (2) zieh; (3) ziehe; (4) geziehen.

ZIEHEN, (h), *draw,* (2) zog; (3) zöge; (4) gezogen.

ZWINGEN, (h), *force,* (2) zwang; (3) zwänge; (4) gezwungen.

FAMILIAR AND SIMPLE PHRASES IN GERMAN

AFFIRMATIVE PHRASES

It is true	*Es ist wahr*
It is so	*Es ist so*
I believe it	*Ich glaube es*
I think so	*Ich denke es*
I say yes	*Ich sage ja*
I say it is	*Ich sage es ist*
I am certain	*Ich bin gewiss*
I am certain of it	*Ich bin dessen gewiss*
You are right	*Sie haben Recht*
You are quite right	*Sie haben ganz Recht*
I know it	*Ich weiss es*
I know it well	*Ich weiss es genau*
I know him	*Ich kenne ihn*
I know it positively	*Ich weiss es sicher*
I promise it	*Ich verspreche es*
I promise it to you	*Ich verspreche es Ihnen*
I give it	*Ich gebe es*
I give it to you	*Ich gebe es Ihnen*
I will give it to you	*Ich will es Ihnen geben*
You are wrong	*Sie haben Unrecht*
He is wrong	*Er hat Unrecht*
I believe him	*Ich glaube ihm*
Very well	*Sehr wohl*
Very well	*Sehr gut*

NEGATIVE PHRASES

No	*Nein*
I say no	*Ich sage nein*
I say it is not	*Ich sage es ist nicht*
It is not so	*Es ist nicht so*
It is not true	*Es ist nicht wahr*
I say nothing	*Ich sage nichts*
I will say nothing	*Ich will nichts sagen*
I have nothing	*Ich habe nichts*
He is not here	*Er ist nicht hier*
I have it not	*Ich habe es nicht*
He has it not	*Er hat es nicht*
We have it not	*Wir haben es nicht*
You have it not	*Ihr habt es nicht*
He said no	*Er sagte nein*
Has he said no?	*Hat er nein gesagt?*
Has he said nothing?	*Hat er nichts gesagt?*
I did not hear	*Ich habe nicht gehört*
I have not heard it	*Ich habe es nicht gehört*
You are quite wrong	*Sie haben durchaus Unrecht*

INTERROGATIVE PHRASES

Who?	*Wer?*
Who was it?	*Wer war es?*
What is it?	*Was ist es?*
Who is it?	*Wer ist es?*
Did you say it?	*Sagten Sie es?*
What are you doing?	*Was thun Sie?*
What is he doing?	*Was thut er?*
Tell me	*Sagen Sie mir*
Will you tell me?	*Wollen Sie mir sagen?*
How are you?	*Wie gehts?*
How is he?	*Wie gehts ihm?*

What for?	*Wofür?*
Why?	*Warum?*
Why do you ask?	*Warum fragen Sie?*
Why shall I go?	*Warum soll ich gehen?*
Why do you speak?	*Warum sprechen Sie?*
Why are you silent?	*Warum schweigen Sie*
Why did you go?	*Warum gingen Sie?*
Is it ready?	*Ist es fertig?*
Have you heard?	*Haben Sie gehört?*
Do you hear?	*Hören Sie?*
Where?	*Wo?*
Where is it?	*Wo ist es?*
Where is he?	*Wo ist er?*
Where is she?	*Wo ist sie?*
Where are you?	*Wo sind Sie?*
Where are you going?	*Wo gehen Sie hin?*
Where do you come from?	*Wo kommen Sie her?*
Where were you?	*Wo waren Sie?*
What?	*Was?*
What is it?	*Was ist es?*
What is that?	*Was ist das?*
What time is it?	*Was ist die Zeit?*
What o'clock is it?	*Wie viel Uhr ist es?*
What have you?	*Was haben Sie?*
What do you say?	*Was sagen Sie?*
What did you say?	*Was sagten Sie?*
What do you mean?	*Was meinen Sie?*
What do you want?	*Was wollen Sie?*
What will you do?	*Was wollen Sie thun?*

IMPERATIVE PHRASES

Come away!	*Kommen Sie fort!*
Come here!	*Kommen Sie hierher!*
Go there!	*Gehen Sie dorthin!*
Come back!	*Kommen Sie zurück!*
Go on!	*Gehen Sie weiter!*
Sit down!	*Setzen Sie sich!*
Stand still!	*Stehen Sie still!*
Wait	*Warten Sie*
Wait for me	*Warten Sie auf mich*
Wait a little	*Warten Sie ein wenig*
Make haste	*Machen Sie schnell*
Be quick	*Beeilen Sie sich*
Follow me	*Folgen Sie mir*
Follow him	*Folgen Sie ihm*
Tell him	*Sagen Sie ihm*
Call him	*Rufen Sie ihn*
Speak	*Sprechen Sie*
Eat	*Essen Sie*
Drink	*Trinken Sie*
Hear	*Hören Sie*
Hear me	*Hören Sie mich*
Look at me	*Sehen Sie mich an*
Look at him	*Sehen Sie ihn an*
Begin	*Fangen Sie an*
Continue	*Fahren Sie fort*
Stop	*Halt*
Tell me	*Sagen Sie mir*
Tell it him	*Sagen Sie es ihm*
Speak to me	*Sprechen Sie mit mir*
Speak to him	*Sprechen Sie mit ihm*
Be quiet	*Seien Sie ruhig*
Go	*Gehen Sie*
Go to him	*Gehen Sie zu ihm*
Go to bed	*Gehen Sie zu Bette*
Fetch	*Holen*
Fetch it	*Holen Sie es*
Bring it	*Bringen Sie es*
Bring it to me	*Bringen Sie es mir*
Let it be	*Lassen Sie es sein*
Let me have it	*Lassen Sie es mich haben*

EXPRESSIONS OF JOY

What!	*Was!*
Is it possible!	*Ist es möglich!*
Can it be!	*Kann es sein!*
How can it be possible!	*Wie kann es möglich sein!*
Who would have believed it!	*Wer würde das geglaubt haben!*
Indeed!	*Wirklich!*
It is impossible	*Es ist unmöglich*
That can not be	*Es kann nicht sein*
I am astonished at it	*Ich wundere mich darüber*
You surprise me	*Sie überraschen mich*
It is incredible	*Es ist unglaublich*

OF SORROW AND JOY

I am sorry	*Es thut mir leid*
I am very sorry	*Es thut mir sehr leid*
What a pity	*Wie schade*
It is a great pity	*Es ist sehr schade*
It is a sad thing	*Es ist eine traurige Sache*
It is a misfortune	*Es ist ein Unglück*
It is a great misfortune	*Es ist ein grosses Unglück*
I am glad	*Es ist mir lieb*
I am glad of it	*Ich freue mich darüber*
I am very glad	*Es ist mir sehr lieb*
It gives me pleasure	*Es macht mir Vergnügen*
It gives me great joy	*Es macht mir grosse Freude*
I am happy	*Ich bin glücklich*
How happy I am	*Wie glücklich ich bin*
I wish you joy	*Ich wünsche Ihnen Glück*
I congratulate you	*Ich gratulire Ihnen*

OF ANGER AND BLAME

I am angry	*Ich bin ärgerlich*
He is angry	*Er ist ärgerlich*
He is very angry	*Er ist sehr ärgerlich*
Don't be angry	*Seien Sie nicht ärgerlich*
You are wrong	*Sie haben Unrecht*

You are right	*Sie haben Recht*
Why don't you do it?	*Warum thun Sie es nicht?*
Be quiet	*Seien Sie ruhig*
What a shame!	*Welche Schande!*
How could you do it?	*Wie konnten Sie es thun?*
I am ashamed of you	*Ich schäme mich Ihrer*
You are very much to blame	*Sie sind sehr zu tadeln*
Don't answer	*Antworten Sie nicht*
Be patient	*Gedulden Sie sich*
I will improve	*Ich werde mich bessern*

EASY EXPRESSIONS

Tell me	*Sagen Sie mir*
If you please	*güttigst—gefälligst*
Have the goodness	*Haben Sie die Güte*
Yes, Sir	*Ja, mein Herr*
Yes, Madam	*Ja, Madam*
No, Sir	*Nein, mein Herr*
No, Madam	*Nein, Madam*
No, Miss	*Nein, mein Fräulein*
Do you speak	*Sprechen Sie*
German?	*deutsch?*
English?	*englisch?*
or French?	*oder französisch?*
I do not speak German	*Ich spreche nicht deutsch*
I speak it a little	*Ich spreche etwas*
I understand	*Ich verstehe*
I understand it but	*Ich verstehe es aber*
I do not speak it	*Ich spreche es nicht*
I speak English	*Ich spreche englisch*
I am an Englishman	*Ich bin ein Engländer*
I speak French a little	*Ich spreche ein wenig französisch*
I am not a Frenchman	*Ich bin kein Franzose*
Do you understand?	*Verstehen Sie?*
Can you understand?	*Können Sie verstehen?*
Speak slower	*Sprechen Sie langsamer*
You speak too fast	*Sie sprechen zu schnell*
Give me	*Geben Sie mir*
some bread	*Brod*
some butter	*Butter*
some water	*Wasser*
some tea	*Thee*
some wine	*Wein*
some meat	*Fleisch*
something	*etwas*
to eat	*zu essen*
to drink	*zu trinken*
Bring me	*Bringen Sie mir*
some coffee	*Kaffee*
some milk	*Milch*
some cheese	*Käse*
I thank you	*Ich danke Ihnen*

TO ASK QUESTIONS

What do you say?	*Was sagen Sie?*
Do you hear?	*Hören Sie?*
Do you hear me?	*Hören Sie mich?*
I don't speak to you	*Ich spreche mit Ihnen nicht*
Do you understand me?	*Verstehen Sie mich?*
Listen	*Hören Sie*
Come here	*Kommen Sie hierher*
What is that?	*Was ist das?*
Answer	*Antworten Sie*
Why don't you answer?	*Warum antworten Sie nicht?*
What do you mean?	*Was meinen Sie?*
What do you mean by that?	*Was meinen Sie damit?*
You speak German I suppose	*Ich vermuthe Sie sprechen deutsch*
Very little, Sir	*Sehr wenig, mein Herr*
I can understand, but I can not speak it	*Ich kann es verstehen, aber sprechen kann ich nicht*
Do you know me?	*Kennen Sie mich?*
Do you know Mr. H?	*Kennen Sie Herrn H?*
I know him	*Ich kenne ihn*
I do not know him	*Ich kenne ihn nicht*
I know you	*Ich kenne Sie*
I know him by sight	*Ich kenne ihn von Ansehen*
I know him by name	*Ich kenne ihn bei Namen*
I know him well	*Er ist mir wohl bekannt*
What do you call that?	*Wie nennen Sie das?*
What is that in German?	*Wie heisst das auf deutsch?*
What do you call that in English?	*Wie heisst das auf englisch?*
What does that mean?	*Was heisst das?*
What is it good for?	*Wozu ist es gut?*
It is good for nothing	*Es ist zu nichts gut*
Is it good?	*Ist es gut?*
Is it bad?	*Ist es schlecht?*
Is it eatable?	*Ist es essbar?*
Is it drinkable?	*Ist es trinkbar?*
Is it nice?	*Ist es schön?*
Is it fresh?	*Ist es frisch?*

AGE

How old are you?	*Wie alt sind Sie?*
I am twenty	*Ich bin zwanzig Jahr alt*
I shall soon be thirty	*Ich werde bald dreissig sein*
He looks older	*Er sieht älter aus*

She is younger	*Sie ist jünger*
She can not be so young	*Sie kann nicht so jung sein*
He must be older	*Er muss älter sein*
I did not think you were so old	*Ich glaubte nicht dass Sie so alt sein*
He is at least sixty	*Er ist wenigstens sechszig*
She must be forty	*Sie muss vierzig Jahr alt sein*
How old is your father?	*Wie alt ist Ihr Vater?*
He is nearly eighty	*Er ist nahe achtzig*
Is he so old?	*Ist er so alt?*
How old is your sister?	*Wie alt ist ihre Schwester?*
She is fifteen	*Sie ist fünfzehn*
Is she so young?	*Ist sie so jung?*
How old is your aunt?	*Wie alt ist Ihre Tante*
She is nearly ninety	*Sie ist fast neunzig*
It is a great age	*Es ist ein hohes Alter*
He begins to grow old	*Er fängt an alt zu werden*

MORNING

An early morning	*Ein früher Morgen*
Early	*Früh*
It is a fine morning	*Es ist ein schöner Morgen*
What o'clock is it?	*Wie viel Uhr ist es?*
It is nearly eight	*Es ist nahe acht Uhr*
It is a quarter after four	*Es ist viertel nach vier*
It is half-past two	*Es ist halb drei*
Light the fire	*Zünden Sie das Feuer an*
Light a candle	*Zünden Sie ein Licht an*
I am going to get up	*Ich will aufstehen*
Get me some hot water	*Bringen Sie mir etwas heisses Wasser*
Some cold water	*Etwas kaltes Wasser*
Some spring-water	*Etwas Trinkwasser*
Make haste	*Machen Sie schnell*

MEETING

Good-morning	*Guten Morgen*
Good-day	*Guten Tag*
Good-afternoon	*Guten Nachmittag*
How do you do?	*Wie geht's?*
How are you?	*Wie befinden Sie sich?*
Very well	*Sehr wohl*
I am very well	*Ich befinde mich sehr wohl*
Pretty well	*Ziemlich wohl*
Tolerably	*So ziemlich*
How is your father?	*Wie befindet sich Ihr Herr Vater?*
How is your mother?	*Wie befindet sich Ihre Frau Mutter?*
I am not well	*Ich bin nicht wohl*
I am unwell	*Ich bin unwohl*
She is not well	*Sie ist nicht wohl*
He is not well	*Er ist nicht wohl*
She is ill	*Sie ist krank*
He is very ill	*Er ist sehr krank*
She has a cold	*Sie hat sich erkältet*
I have the toothache	*Ich habe Zahnweh*
I must go	*Ich muss gehen*
I am going now	*Ich gehe jetzt*
It is time to go	*Es ist Zeit zu gehen*
Good-by	*Leben Sie wohl*
Farewell	*Adieu*
I wish you a good-morning	*Ich wünsche Ihnen einen guten Morgen*
Good-evening	*Guten Abend*
Good-night	*Gute Nacht*
I wish you good-night	*Ich wünsche Ihnen gute Nacht*
My compliments at home	*Meine Empfehlungen den Ihrigen*

A VISIT

There is a knock	*Es klopft*
It is Mr. A.	*Es ist Herr A.*
It is Mrs. B.	*Es ist Madam B.*
I am glad to see you	*Ich freude mich Sie zu sehen*
Pray be seated	*Bitte setzen sie sich*
What news is there?	*Was giebt's Neues?*
Good news	*Gute Nachrichten*
Do you believe it?	*Glauben Sie es?*
I don't believe a word of it	*Ich glaube kein Wort davon*
I think so	*Ich denke (glaube) so*
I think not	*Ich denke nicht*
Who told you?	*Wer hat es Ihnen gesagt?*
It is true	*Es ist wahr*
It is not true	*Es ist nicht wahr*
I doubt it	*Ich bezweifle es*
Have you heard from home?	*Haben Sie von Hause gehört?*
The postman brought me a letter to-day	*Der Briefträger brachte mir heute einen Brief*
Sad news	*Schlechte Nachrichten*
Will you dine with us?	*Wollen Sie mit uns speisen?*
No, thank you	*Nein, ich danke Ihnen*
I can not stay	*Ich kann nicht bleiben*
I must go	*Ich muss gehen*
You are in a great hurry	*Sie sind in grosser Eile*
I have a great deal to do	*Ich habe viel zu thun*

SPANISH SELF-TAUGHT

OF all modern languages, except the Portuguese, the Spanish presents the closest approximations to the grammar and constructions of classical Latin. Like French and several other European dialects, it represents the Latin in a more or less advanced stage of decomposition. Thus, as in English and French, the regular case endings used in the inflection of nouns and adjectives have been abandoned, and the oblique cases are formed with prepositions. The use of the personal pronouns very much resembles that of Latin, since, when the subjects of verbs, they are regularly omitted except where emphasis requires them to be expressed.

The syntax of Spanish is very simple, and in very many cases quite agrees with the English usage. Thus, the student attempting to speak is saved many errors arising from perplexity regarding the proper order of words. While the Spanish verb presents some departures from constructions understood by English-speaking people, the idioms are, for the most part, simple and logical in theory and readily to be understood. Taken all in all, the Spanish is far easier of acquisition than even the German. By students thoroughly grounded in Latin it may be acquired with surprising ease.

THE SPANISH ALPHABET AND PRONUNCIATIONS

THE Spanish alphabet contains twenty-seven letters, exclusive of K and W, which are used only in foreign words. It contains, however, three characters, *ch*, *ll*, and *ñ*, which are regularly regarded as separate letters. *Ch* (tchay) has been considered a separate letter since 1803. *Ll* and *ñ* are called "ligatured consonants," both having a consonant *y* sound after the letter represented. The alphabet is as follows:

A, a (ah).

Always pronounced like *a* in the English words "art" and "father."

B, b (bay).

Pronounced as in English, although in some parts of Spain it is confused with V.

C, c (thay)

When followed by *a*, *o*, *u*, or any consonant, sounds like *k;* before *e* and *i*, it sounds like *th* in "think."

Ch, ch (tchay).

Pronounced like *ch* in "child."

D, d (day).

Pronounced as in English. At the end of words it sounds somewhat like *th* in "though."

E, e (ay).

Pronounced like the sound of *a* in the word "male."

F, f (ay-fay).

Pronounced as in English.

G, g (hay).

Has two distinct sounds; before *a*, *o*, *u*, or consonant, it sounds like *g* in the English words "girl" and "good"; before *e* and *i*, it sounds like *h* in the English words "high," "hay."

H, h (ah-tchay).

Is silent in the Spanish language, pronounced as if no such *h* were there.

I, i (e).

Sounds like *e* in the English word "evil."

J, j (hoe-tah).

Is pronounced like *h* in the English words "horse," "hall," "hill."

L, l (ai-lay).

Pronounced as in English.

Ll, ll (ail-yay).

Similar sound to the English word "William." At the beginning of a word the first *l* is vocalized; the second given with a consonant *y* sound following.

M, m (ai-may).

Pronounced as in English.

N, n (ai-nay).

Pronounced as in English.

Ñ, ñ (ain-yay).

Always pronounced like *ni* in the English words "pinion," "minion."

O, o (o).

Pronounced like the English *o* in the word "organ," and when accented, like the *o* in "old."

P, p (pay).

Pronounced as in English.

Q, q (coo).

Pronounced as the English *k* before *ue* and *ui*, in all other instances it has been replaced by *c*.

R, r (er-ay).

When single is pronounced as in English; at the beginning of a word and when double, it has a strong rolling sound. Nearest possible sound: *rr*—er'-ray. Final *r* has the full rolling sound, almost like double *r* in English.

S, s (ai-say).

Pronounced like the English *s* in the words "say," "simple," "seven."

T, t (tay).

Pronounced as in English.

U, u (oo).

Pronounced as the English *u* in the word "pull"; it is silent in the syllables *gue*, *gui*, except when it has a diæresis over it, thus *ü*. In the syllables *que*, *qui*, is always silent.

V, v (vay).

Pronounced as in English.

X, x (ay-kiss).

Has the sound of *x* in the English word flax.

Y, y (e-gree-ai-gah).

Has the sound of *e* in the English word "evil."

Z, z (thay-tah).

Pronounced like *th* in the English word "thin."

PRONUNCIATION

The pronunciation of Spanish is easy of acquisition, since the sounds of the vowels and consonants once understood, and a few simple rules of variation learned, it will be found that there is positively no necessity for uncertainty regarding the pronunciation of any word. In this respect it presents many advantages over the French, and is certainly easier to learn than the English.

A good general rule for the pronunciation of Spanish is to remember that one must acquire great distinctness in enunciation. There are no silent consonants if we except *h;* so that, when the student has once mastered the sounds belonging to the various letters, he may learn the proper pronunciation of separate words by pronouncing them slowly and distinctly, giving the full sound and value to each letter. By cultivating the habit of clear and distinct pronunciation, giving each letter a separate dynamic impulse, the peculiar intonation of Spanish may be readily acquired.

SPANISH VOWELS

In Spanish, as in other languages, the vowels are long and short. However, the distinction between the two is not in the sounds belonging to them, but, properly, in the time occupied in pronunciation. Thus, the long vowels are pronounced fully, and at length, while the short vowels are given rapidly, although with the same qualities of sound. This rule should be thoroughly understood by the student, and will remove a fertile source of perplexity at the beginning of his studies.

SPANISH CONSONANTS

As in English and some other languages, there are two classes of vowels recognized in Spanish. These are called the "weak" and the "strong" vowels; these names being given on account of their influence upon the sound of a preceding consonant. The strong vowels are *a, o, u,* the weak vowels *e, i.* Thus, *c* before a strong vowel is sounded like *k,* but before a weak vowel, like *th* in "think," etc.; *g* before a strong vowel is hard, but before a weak vowel is sounded like guttural *h.* Since this rule is invariable, hard *c* before a weak vowel becomes *qu,* and soft *c* before a strong vowel becomes *z.* Also, hard *g* before weak vowels becomes *gu,* while soft *g* before strong vowels becomes *j.*

Y is a consonant letter. When used as a consonant at the beginning of words or between vowels it has the same sound as when used in English in the words *youth* and *year.* When it (y) stands alone it serves as a vowel, used as a copulative conjunction meaning *and;* it is also used instead of the vowel *i* at the end of words; as *ley,* law; *soy,* I am; *estoy,* I am; *rey,* king. As a conjunction meaning *and* it is used as follows: *Juan y Pedro,* John and Peter; *Salud y dinero,* Health and money.

DOUBLE LETTERS

In pure Spanish no letters, except *e, i, c, r,* are written double—*ll* being considered one letter—and these occur only under certain conditions. Consonant combinations are much less numerous, and much less frequent, than in almost any other language. This is an important point, which the student will find of use in comparing similar, or cognate, words from Spanish and English in the following vocabulary.

ACCENT

Words ending in consonants are accented on the last syllable: as *salud,* health; *cantar,* to sing. Words ending in a vowel or a diphthong are accented on the penultimate syllable: as *blanco,* white; *silla,* chair; *campana,* bell; *ruido,* noise; *cielo,* heaven; *reino,* kingdom. This is called the "tonic accent."

The written accent is used only on words that do not follow the above two rules. When the written accent is used, it indicates where to lay the stress of the voice, as *azúcar,* sugar; *papá,* papa; *sábado,* Saturday. The vowels *á, é, ó, ú,* when standing alone, are always accented. This is called the "graphic accent."

The acute accent (′) is the only one used in the Spanish language.

VOCABULARY OF FAMILIAR AND USEFUL WORDS

To THE STUDENT familiar with Latin, the acquisition of a good-sized Spanish vocabulary will be easy, after a few simple rules of vowel and consonant variation have been understood. The English-speaking student is in very nearly the same position of advantage—provided he have an intelligent comprehension of his own language; since both Spanish and English are very largely of Latin origin. Thus, very many English words derived direct from Latin roots have their counterparts in Spanish.

Several hundred English words, of Latin origin, ending in *tion* and *sion,* are found practically the same in Spanish, except for the change to the ending *cion.* Among these are *accion* (action), *conversacion* (conversation), *declaracion* (declaration), *invencion* (invention), *nacion* (nation), *diccion* (diction), *ratificacion* (ratification), *habitacion* (habitation), etc.

A number of English nouns of Latin origin ending in *ty* have counterparts in Spanish with the ending *tad* or *dad.* Thus: *libertad* (liberty), *vanidad* (vanity), *gravedad* (gravity), *necesidad* (necessity), *sociedad* (society).

The following brief vocabulary will furnish the attentive student with a number of the other common variations of suffixes that, with close observation of vowel and consonant changes, will soon enable him to greatly increase his store of ready words.

The pronunciations appended to these words are, as far as possible, given with unmistakable English combinations. Note that *ah* and *oh* correspond in sound to the English interjections so spelled.

THE WORLD AND SEASONS

English	Spanish	Pronunciation
The earth	*la tierra*	lah teeayrrah
the sea	*el mar*	ail mahr
the water	*el agua*	ail ahgooah
the fire	*el fuego*	ail fooaygoh
the wind	*el viento*	ail veeayntoh
the rain	*la lluvia*	lah youveeah
the snow	*la nieve*	lah neeayvay
the ice	*el hielo*	ail eeayloh
the day	*el dia*	ail deeah
the night	*la noche*	lah nochay
the sun	*el sol*	ail sohl

English	Spanish	Pronunciation
the moon	*la luna*	lah loonah
the stars	*las estrellas*	lahs aystrayyahs
the river	*el rio*	ail reeoh
the animals	*los animales*	lohs ahneemah-lays
the air	*el aire*	ail ah-eeray
the morning	*la mañana*	lah mahnyaynah
the evening	*la tarde*	lah tahrday
the year	*el año*	ail ahnioh
the century	*el siglo*	ail seegloh
the lake	*el lago*	ail lahgoh
the winter	*el invierno*	ail eenveeayrnoh
the summer	*el verano*	ail vayrahnoh
the fall	*el otoño*	ail otonyeeoh
the spring	*la primavera*	la preemahvay-rah
the heat	*el calor*	ail cahlohr
the seasons	*las estaciones*	lahs aystahthee-ohnays
the stream	*la corriente*	lah cohrreeayntay

THE HUMAN BODY

the head	*la cabeza*	lah cahbaythah
the face	*la cara*	lah cahrah
the arm	*el brazo*	ail brahthoh
the eyes	*los ojos*	lohs ohos
the ears	*las orejas*	lahs ohrayhahs
the eyebrows	*las cejas*	lahs thayhahs
the neck	*el pescueso*	ail payskooaysoh
the chest	*el pecho*	ail paychoh
the hand	*la mano*	lah mahnoh
the finger	*el dedo*	ail daydoh
the hair	*el pelo*	ail payloh
the mouth	*la boca*	lah bohkah
the nose	*la naris*	lah nahreeth
the foot	*el pie*	ail peeay
the lips	*los labios*	lohs lahbeeohs
the leg	*la pierna*	lah peeayrnah
the knee	*la rodilla*	lah rohdeeyah
the elbows	*los codos*	lohs kohdohs
the blood	*la sangre*	lah sahngray
the shoulders	*las paletas*	lahs pahlaytahs
the skin	*la piel*	lah peeayl
the tooth	*el diente*	ail deeayntay
the teeth	*los dientes*	lohs deeayntays
the tongue	*la lengua*	lah layngooah
the bones	*los huesos*	lohs ooaysohs
the back	*la espalda*	lah ayspahldah

HOUSE AND EATING UTENSILS

the chair	*la silla*	lah seeyah
the table	*la mesa*	lah maysah
the armchair	*el sillon*	ail seeyohn
the looking-glass	*el espejo*	ail ayspayhoh
the pillows	*la almohada*	la ahlmohahdah
the sheets	*las sabanas*	lahs sahbahnahs
the towel	*la toalla*	lah tohahyah
the tablecloth	*el paño de mesa*	ail pahnyeeoh day maysah
the cup	*la tasa*	lah tahsah
the knife	*el cuchillo*	ail coocheeyoh
the spoon	*la cuchara*	lah coochahrah
the bowl	*la escudilla*	lah ayscoodeeyah
the clock	*el reloj*	ail rayloh
the trunk	*el baul*	ail bahool
the box	*la caja*	lah cah-hah
the mattress	*el colchon*	ail cohlchohn
the lamp	*la lampara*	lah lahmpahrah
the plate	*el plato*	ail plahtoh
the fork	*el tenedor*	ail taynaydohr
the candlestick	*el candelero*	ail cahndaylay-roh
the bed	*la cama*	lah cahmah
the napkin	*la servilleta*	lah sayrveeyay-tah

FOOD

English	Spanish	Pronunciation
the meat	*la carne*	lah carnay
the bread	*el pan*	ail pan
the flour	*la harina*	lah ahreenah
veal	*carne de ternera*	carnay day tayr-nayrah
mutton	*carne de carnero*	carnay day car-nayroh
lamb	*cordero*	cordayroh
pork	*carne de puerco*	carnay day poo-ayrcoh
bacon	*tocino*	tohtheenoh
ham	*jamon*	hamohn
butter	*mantequilla*	mahntaykee-yah
cheese	*queso*	kaysoh
fish	*pescado*	payscahdoh
fowl	*ave*	ahvay
chicken	*pollo*	pohl-yoh
turkey	*pavo*	pahvoh
pigeon	*paloma*	pahlohmah
quail	*codornis*	codorneeth
partridge	*perdis*	payrdeeth
rice	*arroz*	ahr-roth
eggs	*huevos*	ooayvohs
pie	*pastel*	pahstayl
oysters	*ostiones*	ohsteeohnays
lobster	*langosta*	lahngostah
desserts	*postres*	postrays
ice cream	*helados*	aylahdohs

VEGETABLES

potatoes	*papas*	papas
beans	*frijoles*	freehohlays
carrots	*zanahoria*	thanahoreeah
turnips	*nabo*	nahboh
lettuce	*lechuga*	laychoogah
celery	*apio*	ahpeeoh
tomatoes	*tomate*	tomatay
cabbage	*col*	kohl
cauliflower	*coliflor*	kohleeflor
onions	*cebolla*	thaybolyah
parsley	*perejil*	payrayheel
spinach	*espinaca*	ayspeenahka
cucumber	*pepino*	paypeenoh
beet	*remolacha*	raymohlahchah
peas	*chicharos*	cheechahros
radishes	*rábano*	rahbahnoh
asparagus	*espárragos*	aysparrahgohs

DRINKS

water	*agua*	ahgooah
wine	*vino*	veenoh
beer or ale	*cerveza*	thayrvaythah
milk	*leche*	laychay
coffee	*café*	cahfay
chocolate	*chocolate*	chocohlahtay
tea	*te*	tay
gin	*ginebra*	heenaybrah
punch	*ponche*	ponchay
rum	*ron* or *aguardiente*	rohn *or* ahgoo-ahrdeeayntay
coffee and milk	*café con leche*	cahfay cohn laychay
lemonade	*limonada*	leemohnahdah
orangeade	*naranjada*	nahrahnhahdah
buttermilk	*suero*	sooayroh
milk punch	*ponche de leche*	ponchay day laychay
sherry	*vino de jeres*	veenoh day hayrayth
port wine	*vino de oporto*	veenoh day ohportoh
claret	*vino tinto*	veenoh teentoh
champagne	*vino de champaña*	veenoh day champahnyah

MEN'S AND WOMEN'S CLOTHING

English	Spanish	Pronunciation
the hat	*el sombrero*	ail sohmbrayroh
the shirt	*la camisa*	lah cahmeesah
the coat	*la levita*	lah layveetah
the pants	*el pantaloon*	ail pantahlohn
the collar	*el cuello*	ail kooaylyoh
the cuffs	*los puños*	lohs poonyohs
the cloak	*la capa*	lah cahpah
the necktie	*la corbata*	lah cohrbahtah
the cap	*la gorra*	lah gohr-rah
the overcoat	*el sobretodo*	ail sohbray-tohdoh
the jacket	*la chaqueta*	lah chahkaytah
the dress	*el vestido*	ail vaysteedoh
the skirt	*las faldas*	lahs fahldahs
the hose / the stockings	*las medias*	lahs maydeeahs
the handkerchief	*el pañuelo*	ail pahnyooay-loh
the shoes	*los zapatos*	lohs thahpahtohs

WRITING MATERIALS

the paper	*el papel*	ail pahpayl
the pen	*la pluma*	lah ploomah
the ink	*la tinta*	lah teentah
the inkstand	*el tintero*	ail teentayroh
the pencil	*el lapiz*	ail lahpeeth
the sealing-wax	*el lacre*	ail lahcray
the wafer	*la oblea*	lah ohblayah
the ruler	*la regla*	lah rayglah
the penknife	*el cortaplumas*	ail cortah-ploo-mahs
the envelope	*el sobre*	ail sohbray
the post-stamp	*el sello de correo*	ail saylyo day cohrrayoh
the letter	*la carta*	lah cartah
a sheet of paper	*una hoja de papel*	oonah ohah day paypayl
blotting paper	*papel secante*	papayl saycantay
stamped paper	*papel sellado*	papayl saylyah-doh
the address	*la direccion*	lah deeraykthee-ohn

RELATIONS

the mother	*la madre*	lah mahdray
the father	*el padre*	ail pahdray
the grandmother	*la abuela*	lah ahbooaylah
the grandfather	*el abuelo*	ail ahbooayloh
the son	*el hijo*	ail eehoh
the daughter	*la hija*	lah eehah
the brother	*el hermano*	ail ayrmahnoh
the uncle	*el tio*	ail teeo
the aunt	*la tia*	ah teea
the nephew	*el sobrino*	ail sohbreenoh
the niece	*la sobrina*	lah sohbreenah
the girl	*la muchacha*	lah moochahchah
the boy	*el muchacho*	ail moochahchoh
the wife	*la esposa*	lah ayspohsah
the husband	*el esposo*	ail ayspohsoh
the man	*el hombre*	ail ohmbray
the woman	*la mujer*	lah moohayr
the bride	*la novia*	lah nohveeah
the bridegroom	*el novio*	ail nohveeoh
the widow	*la viuda*	lah viewdah
the widower	*el viudo*	ail viewdoh
the friend (male)	*el amigo*	ail ahmeegoh
the friend (female)	*la amiga*	lah ahmeegah
the child (male)	*el niño*	ail neenyoh
the child (female)	*la niña*	lah neenyah
the cousin	*el primo*	ail preemo
the young man	*el joven*	ail hohvayn
the young woman	*la joven*	lah hohvayn

TOWN, HOUSE, AND COUNTRY

the town	*el pueblo*	ail pooaybloh
the country	*el campo*	ail cahmpoh
my country	*mi pais*	mee pahees
the city	*la ciudad*	lah theeoodad
the village	*la villa*	lah veelyah
the building	*el edificio*	ail aydeefee-theeoh
the street	*la calle*	lah cahlyay
the house	*la casa*	lah cahsah
the schoolhouse	*la escuela*	lah ayskooaylah
the church	*la iglesia*	lah eeglayseeah
the hospital	*el hospital*	ail ospeetahl
the inn	*la posada*	lah pohsahdah
the post-office	*el correo*	ail cohrayoh
the theatre	*el teatro*	ail tayahtroh
the hotel	*el hotel*	ail ohtayl
the tavern	*la taberna*	lah tahbayrnah
the custom-house	*la aduana*	lah ahdooahnah
the library	*la biblioteca*	lah beebleeo-taycah
the bridge	*el puente*	ail pooayntay
the tower	*la torre*	lah torray
the castle	*el castillo*	ail casteelyoh
the shop	*la tienda*	lah teeayndah
the exchange	*la bolsa*	lah bolsah
the prison	*la carcel*	lah carthayl
the university	*la universidad*	lah ooneevayr-seedad
the cathedral	*la catedral*	lah cataydrahl
the palace	*el palacio*	ail pahlahtheeoh
the window	*la ventana*	lah vayntahnah
the door	*la puerta*	lah pooayrtah
the wall	*la pared*	lah pahrayd
the key	*la llave*	lah yahvay
the bell	*la campana*	lah campahnah
the staircase	*la escalera*	lah ayskalayrah
the parlor	*la sala*	lah sahlah
the dining-room	*el comedor*	ail comaydohr
the bedroom	*el cuarto de dormir*	ail kooahrto day dormeer
the room	*el cuarto*	ail kooahrto
the kitchen	*la cocina*	lah cotheenah
the roof	*el techo*	ail taychoh
the cellar	*el sotano*	ail sohtahnoh
the garden	*el jardin*	ail hardeen
the market	*el mercado*	ail mayrkadoh
the bank	*el banco*	ail bankoh
the coffee-house	*el café*	ail cahfay
the harbor	*el puerto*	ail pooayrtoh
the field	*el campo*	ail campoh
the bush	*la breña*	lah brenyah
the oven	*el horno*	ail ornoh
the straw	*la paja*	lah pahah
the corn	*el maiz*	ail maheeth
oats	*avena*	ahvaynah
the mill	*el molino*	ail moleenoh
the hill	*la loma*	lah lomah
the hay	*el heno*	ail aynoh
the soil	*la tierra, el terreno*	lah teeayrrah
the barn	*el granero*	ail grahnayroh
the meadow	*la pradera*	lah pradayrah
the hut	*la choza*	lah chohthah
the cattle	*el ganado*	ail gahnahdoh
the forest	*la selva*	lah saylvah
the shepherd	*el pastor*	ail pastohr
the herd	*la manada*	lah manahdah
the woods	*el bosque*	ail boskay
firewood / split-wood	*la leña*	lah laynyah

English	Spanish	Pronunciation
wheat	*trigo*	treegoh
road	*camino*	cahmeenoh
highroad	*camino-real*	cahmeenoh rayahl
the valley	*el valle*	ail valyay
railroad	*ferro-carril*	fayrroh karreel
a mile	*una milla*	oonah meal-yah
the waterfall	*la cascada*	lah cahscahdah

NATIONS, NATIONALITIES, ETC.

America	*America*	Ahmayreeka
an American	*un Americano*	oon Ahmayree-kano
Mexico	*Mejico*	Mayheeko
a Mexican	*un Mejicano*	oon Mayheekahno
Europe	*Europa*	Ayoorohpah
a European	*un Européo*	oon Ayooroh-payoh
England	*Inglaterra*	Englahtayrrah
an Englishman	*un Inglés*	oon Inglays
France	*Francia*	Frahntheeah
a Frenchman	*un Francés*	oon Frahnthays
Germany	*Alemania*	Ahlaymahneeah
a German	*un Aleman*	oon Ahlayman
Italy	*Italia*	Eatahleeah
an Italian	*un Italiano*	oon Eatahlee-ahno
Switzerland	*Swisa*	Sooeethah
a Swiss	*un Swiso*	oon Sooeethoh
Ireland	*Irlanda*	Ir-landah
an Irishman	*un Irlandés*	oon Ir-landays
Scotland	*Escocia*	Ayskotheeah
a Scotchman	*un Escocés*	oon Ayskothays
Russia	*Rúsia*	Rooseeah
a Russian	*un Rusa*	oon Roosoh
Denmark	*Dinamarca*	Deenahmarka
a Dane	*un Dinamarques*	oon Deenamar-kays
Sweden	*Suécia*	Sooaytheeah
a Swede	*un Sueco*	oon Sooaykoh
Spain	*España*	Ayspahn'yah
a Spaniard	*un Español*	oon Ayspahn'yol
Hungary	*Hungria*	Oongreeah
a Hungarian	*un Hungaro*	oon Oongah-roh
Holland	*Holanda*	Oh-landah
a Dutchman	*un Holandés*	oon Oh-landays
Belgium	*Bélgica*	Belheeka
a Belgian	*un Bélga*	oon Belgah
Austria	*Austria*	Ahoostreeah
an Austrian	*un Austriaco*	oon Ahoostreeah-coh
Brazil	*Brasil*	Brahseal
a Brazilian	*un Brasileño*	oon Brahseel-en'yo
China	*China*	Cheena
a Chinese	*un Chino*	oon Cheeno
Portugal	*Portugal*	Portoogahl
a Portuguese	*un Portugués*	oon Poortoogays
Africa	*Africa*	Ahfreeka
an African	*un Africano*	oon Ahfreekanoh
Asia	*Asia*	Ahseeah
an Asiatic	*un Asiático*	oon Ahseeah-teecoh
Turkey	*Turquia*	Toorkeyah
a Turk	*un Turco*	oon Toorko
Prussia	*Prúsia*	Prooseeah
a Prussian	*un Prusiáno*	oon Prooseeahno
Poland	*Polonia*	Poloneeah
a Polander or Pole	*un Polaco*	oon Polahco
Norway	*Noruéga*	Norooaygah
a Norwegian	*un Noruégo*	oon Norooaygoh
Philippine Islands	*Islas Filipinas*	Eeslahs Feeleepeenahs
a Philippine Islander	*un Filipino*	oon Feeleepeenoh

PROFESSIONS AND TRADES

English	Spanish	Pronunciation
the doctor	*el doctor*	ail dohctohr
the lawyer	*el abogado*	ail ahbohgahdoh
a civil engineer	*el ingeniero civil*	ail eenhayneeayroh ceeveel
a chemist	*un quimico*	oon keemeecoh
a druggist	*un droguista*	oon drohgeesta
the baker	*el panadero*	ail pahnahdayroh
the hatter	*el sombrerero*	ail sohmbrayrayroh
the shoemaker	*el zapatero*	ail thahpahtayroh
the barber	*el barbero*	ail bahrbayroh
the schoolmaster	*el maestro de escuela*	ail mahaystroh day ayskooaylah
the miller	*el molinero*	ail mohleenayroh
the blacksmith	*el herrero*	ail ayr-rayroh
the weaver	*el tejedor*	ail tayhaydohr
the butcher	*el carnicero*	ail cahrneethayroh
the brewer	*el cervecero*	ail bahbrayroh
the tailor	*el sastre*	ail sahstray
the carpenter	*el carpintero*	ail cahrpeentayroh
the mason	*el albañil*	ail ahlbah-nyeel
the bookbinder	*el encuadernador de libros*	ail aynkooahdayr-nahdohr day leebrohs
a priest	*un sacerdote*	oon sahthayrdohtay
a minister	" "	" "
a bishop	*un obispo*	oon ohbeespoh
an archbishop	*un arzobispo*	oon ahrthohbeespoh
the Pope	*el papa*	ail papa
the nun	*la monja*	lah mohnhah

ANIMALS, BIRDS, FISHES, INSECTS

the dog	*el perro*	ail payr-roh
the horse	*el caballo*	ail cahbahlloh
the donkey	*el burro*	ail boor-ro
the pig	*el lechon*	ail laychohn
the colt	*el potro*	ail potroh
the goat	*el chivo*	ail cheevoh
the cat	*el gato*	ail gahtoh
the rat	*la rata*	lah rahta
the mouse	*el raton*	ail rahtohn
an ox	*un buey*	oon booaee
a cow	*una vaca*	oonah vahcah
a calf	*un ternero*	oon tayrnayroh
a sheep	*un carnero*	oon cahrnayroh
a lamb	*un cordero*	oon cohrdayroh
the hare	*la liebre*	lah leeaybray
the monkey	*el mono*	ail mohnoh
a wolf	*un lobo*	oon lohboh
a bear	*un oso*	oon ohsoh
a lion	*un leon*	oon layohn
a tiger	*un tigre*	oon teegray
an elephant	*un elefante*	oon aylayfahntay
a mare	*una yegua*	oonah yaygooah
a bull	*un toro*	oon tohro
a duck	*un pato*	oon pahtoh
a hen	*una gallina*	oonah gahl-yeenah
a cock	*un gallo*	oon gahlyoh
a chicken	*un pollo*	oon pohlyoh
the eagle	*el aguila*	ail ahgeelah
the pheasant	*el faisan*	ail faheesahn
the bat	*el murcielago*	ail moorceeaylahgoh
the partridge	*la perdiz*	lah payrdeeth
the peacock	*el pavo-real*	ail pahvoh reeahl
the swan	*el cisne*	ail theesnay
the goose	*el ganso*	ail gahnsoh
the nightingale	*el ruiseñor*	ail rooeesayn-yohr
the mocking-bird	*el sinsonte*	ail seensohntay
the sparrow	*el gorrion*	ail gohr-reeohn
the parrot	*la cotorra*	lah cohtohr-rah
the bird	*el pajaro*	ail pah-hahroh
a fish	*un pescado*	oon payscahdoh
the pike	*el lucio*	ail lootheeoh
the salmon	*el salmon*	ail sahlmohn
the carp	*la carpa*	lah cahrpah

English	Spanish	Pronunciation
the eel	*la anguila*	lah ahngeelah
the trout	*la trucha*	lah troochah
the herring	*el arenque*	ail ahraynkay
the crab	*el cangrejo*	ail cahngrayhoh
oysters	*ostiones*	ohsteeohnays
the turtle	*la tortuga*	lah tohrtoogah
the whale	*la ballena*	lah bahlyaynah
the frog	*la rana*	lah rahnah
the butterfly	*la mariposa*	lah-mahreepohsah
the fly	*la mosca*	lah mohscah
the spider	*la araña*	lah ahrahnyah
the moth	*la polilla*	lah pohleeyah
a gnat	*un mosquito*	oon mosquito
a bee	*una abeja*	oonah ahbehah
a wasp	*una avispa*	oonah ahveespah
an ant	*una hormiga*	oonah ohrmeegah
a flea	*una pulga*	oonah poolgah
bedbug	*chinche*	cheenchay
insect	*insecto*	eensayctoh
mosquito	*mosquito*	mosquito

TREES, BUSHES, AND FLOWERS

an apple (tree)	*un manzano*	oon mahnthahnoh
a pear (tree)	*un peral*	oon payrahl
a plum (tree)	*un ciruelo*	oon theerooayloh
a cherry (tree)	*un cereso*	oon thayraytho
an orange (tree)	*un naranjo*	oon nahranhoh
a chestnut (tree)	*un castaño*	oon castahnyoh
a currant	*un grosellero*	oon grosaylyayroh
strawberry	*fresa*	fraysah
raspberry	*franbuesa.*	franbooaysah
blackberry	*zarzamora*	tharthahmorah
an oak (tree)	*el roble*	ail roblay
the fir (tree)	*el abeto*	ail ahbaytoh
the willow (tree)	*el sauce*	ail sahoothay
a tree	*un arbol*	oon arbohl
the rose	*la rosa*	lah rohsah
the tulip	*el tulipan*	ail tooleepahn
the pink	*el clavel*	ail clahvayl
the lily	*el lirio*	ail leereeo
the violet	*la violeta*	lah veeohlaytah
the honeysuckle	*la madreselva*	lah mahdraysaylvah
the flower	*la flor*	lah flohr

MINERALS, METALS, AND PRECIOUS STONES

gold	*oro*	ohroh
silver	*plata*	plahtah
iron	*hierro*	eeayrroh
copper	*cobre*	cohbray
steel	*acero*	ahthayroh
zinc	*zinc*	theenk
tin	*hoja de lata*	ohah day lahtah
bronze	*bronce*	bronthay
diamond	*diamante*	deeahmantay
ruby	*rubi*	roobee
pearl	*perla*	payrlah
opal	*opalo*	ohpahlo
coral	*coral*	korahl
emerald	*esmeralda*	aysmayrahldah
sapphire	*zafir*	thahfeer
topaz	*topacio*	topahtheeoh
amethyst	*amatista*	ahmahteestah
marble	*marmol*	marmohl
coal	*carbon*	karbohn
lime	*cal*	kal

TIME, MONTHS, AND DAYS

an hour	*una hora*	oonah ohrah
a minute	*un minuto*	oon meenootoh
a second	*un segundo*	oon saygoondoh
half an hour	*media-hora*	maydeeah ohrah
a quarter of an hour	*un cuarto de hora*	oon kooahrto day ohrah
the time	*el tiempo*	ail teeaympoh
the day	*el dia*	ail deeah
Sunday	*Domingo*	Domeengoh
Monday	*Lúnes*	Loonays
Tuesday	*Mártes*	Martays
Wednesday	*Miércoles*	Meeayrkolays
Thursday	*Juéves*	Hooayvays
Friday	*Viérnes*	Veeayrnays
Saturday	*Sábado*	Sahbahdoh
a month	*un mes*	oon mais
January	*Enero*	Aynayroh
February	*Febrero*	Faybrayroh
March	*Marzo*	Marthoh
April	*Abril*	Ahbreel
May	*Mayo*	Mahyoh
June	*Junio*	Hooneeoh
July	*Julio*	Hooleeoh
August	*Agosto*	Ahgohstoh
September	*Setiembre*	Sayteeaymbray
October	*Octubre*	Octoobray
November	*Noviembre*	Noveeaymbray
December	*Diciembre*	Deeceeaymbray
a week	*una semana*	oonah saymah-nah
a year	*un año*	oon ahnyo
a century	*un siglo*	oon seegloh
the half century	*el medio siglo*	ail maydeeoh seegloh
the morning	*la mañana*	lah mahnyahnah
noon	*el medio-dia*	ail maydeeoh-deeah
the afternoon	*la tarde*	lah tahrday
the evening	*el anochecer*	ail ahnochay-thayr
the night	*la noche*	lah nohchay
midnight	*media-noche*	maydeeah-nohchay
sunrise	*la salida del sol*	lah sahleedah dayl sol
sunset	*la puesta del sol*	lah pooaystah dayl sol
New Year's Day	*Año Nuevo*	Ahnyo Nooay-voh
Christmas	*Navidad*	Nahveedad
Easter	*Pascua de resurreccion*	Paskooah day raysoorrayk-theeon
Whitsuntide	*Dia de Pentecostes*	Deeah day Pen-taycostays
Whit-Sunday	" "	
a holy day	*un dia de fiesta*	oon deeah day feeaystah
Palm Sunday	*Domingo de Ramos*	Domeengoh day Rahmohs

CARDINAL NUMBERS

1	*uno*	oonoh
2	*dos*	dohs
3	*tres*	trays
4	*cuatro*	kooahtroh
5	*cinco*	thinkoh
6	*seis*	say-is
7	*siete*	seeaytay
8	*ocho*	o-tcho
9	*nueve*	nooayvay
10	*diez*	dee'ayth
11	*once*	onthay
12	*doce*	dothay
13	*trece*	treth'-ay
14	*catorce*	kahtorthay
15	*quince*	keenthay
16	*diez y seis*	deeayth e say-ees

English	Spanish	Pronunciation
17	*diez y siete*	deeayth e seeaytay
18	*diez y ocho*	deeayth e ohchoh
19	*diez y nueve*	deeayth e nooayvay
20	*veinte*	vay-in'-tay
21	*veinte y uno*	vay-in'-tay e oonoh
22	*veinte y dos*	vay-in'-tay e dohs
23	*veinte y tres*	vay-in'-tay e trays
24	*veinte y cuatro*	vay-in'-tay e kooahtroh
25	*veinte y cinco*	vay-in'-tay e thinkoh
26	*veinte y seis*	vay-in'-tay e sayees
27	*veinte y siete*	vay-in'-tay e seeaytay
28	*veinte y ocho*	vay-in'-tay e ohchoh
29	*veinte y nueve*	vay-in'-tay e nooayvay
30	*treinta*	tray-in'-tah
31	*treinta y uno*	tray-in'-tah e oonoh
32	*treinta y dos*	tray-in'-tah e dohs
33	*treinta y tres*	tray-in'-tah e trays
34	*treinta y cuatro*	tray-in'-tah e kooahtroh
35	*treinta y cinco*	tray-in'-tah e thinkoh
36	*treinta y seis*	tray-in'-tah e sayees
37	*treinta y siete*	tray-in'-tah e seeaytay
38	*treinta y ocho*	tray-in'-tah e ohchoh
39	*treinta y nueve*	tray-in'-tah e nooayvay
40	*cuarenta*	kooahrayntah
41	*cuarenta y uno*	kooahrayntah e oonoh
42	*cuarenta y dos*	kooahrayntah e dohs
43	*cuarenta y tres*	kooahrayntah e trays
44	*cuarenta y cuatro*	kooahrayntah e kooahtroh
45	*cuarenta y cinco*	kooahrayntah e thinkoh
46	*cuarenta y seis*	kooahrayntah e sayees
47	*cuarenta y siete*	kooahrayntah e seeaytay
48	*cuarenta y ocho*	kooahrayntah e ohchoh
49	*cuarenta y nueve*	kooahrayntah e nooayvay
50	*cincuenta*	thinkoo-entah
60	*sesenta*	saysentah
70	*setenta*	saytentah
80	*ochenta*	o-tchentah
90	*noventa*	noventah
100	*cien*	thieh-en
200	*doscientos*	dos-thieh-en'-tos
300	*trecientos*	treth-e-en'-tos
400	*cuatrocientos*	kooahtroth-e-en'-tos
500	*quinientos*	keeneeayntos
600	*seiscientos*	say-is-thieh-en'-tos
700	*setecientos*	saytay-thieh-en'-tos
800	*ochocientos*	o-tchoth-e-en'-tos
900	*novecientos*	no-veth-e-en'-tos
1,000	*mil*	meel
5,000	*cinco mil*	thinkoh meel
10,000	*diez mil*	dee'ayth meel
20,000	*veinte mil*	vay-in'-tay meel
30,000	*treinta mil*	tray-in'-tah meel
40,000	*cuarenta mil*	kooahrayntah meel
50,000	*cincuenta mil*	thinkoo-entah meel
100,000	*cien mil*	thieh-en meel
200,000	*doscientos mil*	dosthieh-en-tos meel
300,000	*trescientos mil*	treth-e-en'-tos meel
400,000	*cuatrocientos mil*	kooahtroth-e-en'-tos meel
500,000	*quinientos mil*	keeneeayntos meel

ORDINAL NUMBERS

English	Spanish	Pronunciation
1st	*primero* or *primer*	preemayro *or* preemayr
2d	*segundo*	saygoondoh
3d	*tercero* or *tercer*	tayrthayroh
4th	*cuarto*	kooahrtoh
5th	*quinto*	kintoh
6th	*sexto* or *sesto*	sekstoh *or* saystoh
7th	*séptimo* or *sétimo*	septeemoh *or* sayteemoh
8th	*octavo*	oktahvoh
9th	*noveno*	novaynoh
10th	*décimo*	daytheemoh
11th	*undécimo*	oondaytheemoh
12th	*duodécimo*	doo-ohdaytheemoh
13th	*décimo tercio*	daytheemoh tertheeoh
14th	*décimo cuarto*	daytheemoh kooahrtoh
15th	*décimo quinto*	daytheemoh kintoh
16th	*décimo sexto*	daytheemoh sekstoh
17th	*décimo séptimo*	daytheemoh septeemoh
18th	*décimo octavo*	daytheemoh oktahvoh
19th	*décimo noveno*	daytheemoh novaynoh
20th	*vigésimo*	veehayseemoh
30th	*trigésimo*	treehayseemoh
40th	*cuadragésimo*	kooahdrahayseemoh
50th	*quincuagésimo*	kinkooah-hayseemoh
60th	*sexagésimo*	seks-ah-hayseemoh
70th	*septuagésimo*	septooah-hayseemoh
80th	*octogésimo*	oktoh-hayseemoh
90th	*nonagésimo*	nonah-hayseemoh
100th	*centésimo*	thentaytheemoh

CONJUNCTIONS

that	*que*	kay
and	*y*	e
not, nor, neither	*ni*	knee
too, also	*tambien*	tahmbeeayn
neither	*tampoco*	tampoh-co
if, whether	*si*	see
if	*como*	komo
when	*cuando*	cooahndo
so that	*asi que*	ahsee kay
as, according to	*segun*	saygoon
while	*mientras que*	me-entrahs kay
as since, therefore	*pues, pues que*	pooais, pooais kay
why?	*¿porqué?*	porkay?
therefore	*por tanto*	por tayntoh
however	*como quiera que*	komo key-ayrah kay
besides	*fuera de que*	fooayrah day kay
since, inasmuch	*pues, puesto que*	pooais, pooaysto kay
but	*mas, pero*	mahs, payro
even	*aun, cuando*	ahoon, kooahndo
although	*aunque*	ahoonkay
though	"	"
provided	*con tal que*	cohn tahl kay
as	*como, asi como*	komo, ahsee komo
as long as	*mientras tanto*	meeayntras tantoh
instead of	*en lugar de*	en loogahr day
for want of	*por falta de*	por fahltah day
since	*desde que*	desday kay

BRIEF OUTLINE OF SPANISH GRAMMAR

INFLECTION AND CASES

In the inflection of nouns, adjectives, and articles, the several cases—or, more properly speaking, "states"—are usually formed with prepositions; no variation of the word-terminations being found except in forming a feminine from a masculine noun or adjective, and in the formation of the usual line of derivatives.

As in English, the personal pronouns alone have proper cases and vary the words to form them.

According to the classification of most grammarians, the Spanish language has six distinct cases for nouns, adjectives, and participles. These are nominative, genitive, dative, impersonal accusative, personal accusative, prepositional. The nominative is the

case for the subject of all verbs, except the impersonals. The genitive, which corresponds to the English possessive case, is formed by preceding the noun with the preposition *de*, which means "to" or "from." The dative is formed with the preposition *á*, meaning "to" or "at." The prepositional case is used with *de* and all other prepositions. The difference between the personal and the impersonal accusatives is that the former indicates the direct object of a verb, when it represents a human person, or a thing or quality personified. It takes the preposition *á* like the dative. The impersonal accusative is formed, as in other languages, without a preposition, and is used with nouns indicating things, animals, or places. Thus, with nouns, the two forms of accusative occur only with the names of things, places, or qualities liable to be personified.

PREPOSITIONS

to, at	*á*	ah
of, from	*de*	day
in, at, on	*en*	en
by, for, through	*por*	por
without	*sin*	seen
under	*so*	so
but, except	*ménos*	mainohs
toward	*hácia*	ah-theeah
between, among	*entre*	entray
notwithstanding	*no obstante*	no obstantay
on, about, above	*sobre*	sobray
under	*bajo*	bahoh
against	*contra*	cohntrah
with	*con*	cohn
except	*excepto*	eks-thaypto
during	*durante*	doorantay
to, until, up to	*hasta*	ahstah
after, besides	*tras*	trahs
within	*dentro*	dayntro
besides	*además de*	ahdaimas day
for, in order to	*para*	pahrah
so, thus	*asi*	ahsee
on, over	*encima*	enthiemah
outside, beyond	*fuera de*	fooayrah day
far from	*léjos de*	layhos day
near by, close by	*junto á*	hunto ah
touching	*tocante á*	tocahntay ah
in, into, within	*dentro de*	dayntro day

The preposition, *de*, which governs the genitive case, may be translated in a variety of ways—as "of," "from," "by," "with," "at," "to"—or left untranslated in English. The preposition, *á*, governing the dative case, may be translated as "to," "for," "from," or may be found to give the force of a possessive adjective to a definite article following it.

Prepositions governing the prepositional (or ablative) case always precede the unaltered noun, adjective, or pronoun. The sole exception is in the personal pronouns with *con*, which is *prefixed* to the forms *-migo, -tigo, -sigo*, giving *conmigo*, "with me," *contigo*, "with thee," *consigo*, "with himself, herself," etc. All other pronominal forms are perfectly regular. Thus: *con él, con ello, con vosotros*, etc.

THE ARTICLES

In Spanish, as in English, French, and German, there are two articles, the definite and the indefinite.

THE DEFINITE ARTICLE is declined as follows:

Masc. Singular	*Fem. Singular*	
N. *el,*	*la*	the
G. *del*	*de la*	of the
D. *al, para el*	*á la, para la*	to the
A. *el, al*	*la, á la*	the
Pr. *de, con, en, por, sin, sobre el*	*de, con,* etc., *la*	from, with, in, by, without, over the
Masc. Plural	*Fem. Plural*	
N. *los*	*las*	the
G. *de los*	*de las*	of the
D. *á los, para los*	*á las, para las*	to the
A. *los, á los*	*las, á las*	the
Pr. *de, con,* etc., *los*	*de, con,* etc., *las*	from, with the

As may be readily understood, the forms *del* and *al* of the masculine definite article are contractions for *de el* and *á el*.

The masculine article *el* is regularly used with the feminine nouns beginning with *a* or *ha* with the tonic accent.

Another word frequently used is the demonstrative *lo*, called improperly the "neuter article." It is used with adjectives, adverbs, and pronouns to express substantive ideas; its use with nouns being irregular and incorrect. It is declined through all cases, which is to say governed by proper prepositions, like the regular articles given above.

THE INDEFINITE ARTICLE is declined as follows:

Masc.	*Fem.*	
N. *un*	*una*	a
G. *de un*	*de una*	of a
D. *á un*	*á una*	to a
A. *un, á un*	*una, á una*	a
Pr. *de, con, en, por,* etc., *un*	*de, con, en, por,* etc., *una*	from, with, in, by a

As in English, the indefinite article has properly no plural, although the adjective *unos, unas*, meaning "some," is sometimes said to represent the plural. It is used, as in English, mostly with partitives having attributes; also, with attributive expressions in the sense of "a few."

PERSONAL PRONOUNS

The personal pronouns are *yo*, "I"; *tu*, "thou"; *el*, "he"; *ella*, "she"; the formal pronoun *vos*, "you" (singular); and the

word *usted*, "your grace," or "you," which is really a substantive, and always takes the third person of the verb. The plural forms are *nosotros*, "we"; *vosotros*, "you"; *ellos* and *ellas*, "they"; and *ustedes*, "you."

All of these pronouns are in more or less regular use among Spanish-speaking peoples. When used with a verb, as already stated, *usted* and *ustedes* invariably take the third person. It is, in fact, the only pronominal word regularly used with the verb, and is designated by V. (singular) and VV. (plural).

This brings us to one of the most noted peculiarities of the Spanish language, which is that the personal pronouns "I," "you," "he," etc., are not used as subjects of the verb, unless required for emphasis; to give distinctness in a contrast, or in a position where ambiguity might result without them. Thus, as we shall see later, the Spanish verb is inflected precisely as in Latin with personal and tense endings.

The subject "it" of an impersonal verb is never expressed, except in emphatic or interrogative sentences where *ello* is used. Even where the personal pronoun in English is in apposition to the noun, as subject of a verb, it is not expressed in Spanish; the regular rule being that the noun is used with the definite article, apparently as subject of the verb in the proper person.

Thus: "We Spaniards are very backward," *Los Españoles estamos muy atrasados.*

Where the sense of the sentence requires that the pronoun be expressed, the noun still retains the definite article, and follows the pronoun. Thus:

Nosotros los Españoles estamos, etc.

INFLECTION OF THE PRONOUNS.—The personal pronouns, as in English, have a fuller inflection than any other parts of speech, and they alone regularly modify the form to designate case. There are two inflections for the dative and accusative of personal pronouns: the *conjunctive*, representing the construction when governed by a verb, and the *disjunctive*, representing the construction with a preposition. These two forms appear in the accompanying paradigms:

FIRST PERSON

	Sing.	*Plur.*
N.	*yo*, I	*nosotros* (f.—*as*), we
G.	*de mí*, of me, my	*de nosotros* (f.—*as*), of us, our
D.	*me* / *á mí*, me, or to me	*nos* / *á nosotros* (f.—*as*), us, to us
A.	*me* / *á mí*, me	*nos* / *á nosotros* (f.—*as*,), us
Pr.	*mí*, me	*nosotros* (f.—*as*), us

SECOND PERSON

	Singular		*Plural*
	Thou	You	You
N.	*tu*	*vos*	*vosotros* (—*as*)
G.	*de tí*	*de vos*	*de vosotros* (—*as*)
D.	*á tí* / *te*	*á vos* / *os*	*á vosotros* (—*as*) / *os*
A.	*á tí* / *te*	*á vos* / *os*	*á vosotros* (—*as*) / *os*
Pr.	*tí*	*vos*	*vosotros* (—*as*)

THIRD PERSON

	Sing. He (*masc.*)	She (*fem.*)	It (*neut.*)
N.	*él*	*ella*	*ello, lo*
G.	*de él*	*de ella*	*de ello*
D.	*le* / *á él*	*le* / *á ella*	——— / *á ello*
A.	*le, lo* / *á él*	*la* / *á ella*	*lo* / ———
Pr.	*él*	*ella*	*ello*

	Plur. They (*masc.*)	They (*fem.*)	They (*neut.*)
N.	*ellos*	*ellas*	
G.	*de ellos*	*de ellas*	
D.	*les* / *á ellos*	*les* / *á ellas*	NO NEUTER PLURAL
A.	*los, les* / *á ellos*	*las* / *á ellas*	
Pr.	*ellos*	*ellas*	

The student must carefully observe that the *conjunctive* and *disjunctive* accusatives of the personal pronouns do not correspond to the *personal* and *impersonal* accusatives of nouns, adjectives, and articles, although apparently formed on the same theory. The personal pronouns, when direct objects of verbs, are used without prepositions, in the *conjunctive* construction; with prepositions, in the *disjunctive* construction; or the two forms of the same pronoun may be used to indicate the direct object of one and the same verb, in a *pleonastic* construction. Thus, the English sentence, "He seeks thee," may be rendered:

CONJUNCTIVELY, *Te busca;*

DISJUNCTIVELY, *A' tí busca;*

PLEONASTICALLY, *Te busca á tí*, or *A' tí te busca.* In the last construction, emphasis is attained by placing the disjunctive first.

Similarly, this sentence may be rendered:

Le busca á V. (*usted*), or, *A' V.* (*usted*) *le busca.*

To illustrate the plural of the quasi-pronoun *usted*, the following may be given:

Les busca á VV. (*ustedes*), or *A' VV.* (*ustedes*) *les busca.*

The pronominal plural accusative, *les*, is most commonly used with *ustedes.*

"USTED" AND "USTEDES"

The word, *usted, ustedes*, is a contraction of the ancient formal expression, *vuestra merced*, "your grace" ("your honor"), and

vuestras mercedes, "your graces." It is commonly written *V.* or *Vd.* in the singular, and *VV.* or *Vds.* in the plural, being always read in full like the English "Mr." (Mister) or "St." (Saint).

As a personal pronoun, it is a very good analogue of the German *Sie,* "you," which is declined precisely like *sie,* "they," and also takes the verbal forms of the third person (plural). In declension, *usted* follows the rule for nouns without the article, but has *substitute forms* from the *third personal* pronouns in the dative and accusative of both numbers. Thus:

	Sing.	*Plur.*
N.	*usted*	*ustedes*
G.	*de usted*	*de ustedes*
D.	*á usted,* or *le*	*á ustedes,* or *les.*
A.	*á usted,* or *le, la*	*á ustedes,* or *los, les, las*
Pr.	*usted*	*ustedes*

The substantive character of this word is seen in the fact that it has only the *personal accusative* form in both numbers, except in its *pronominal substitutes,* which are always *conjunctive,* omitting the preposition, *á.* This permits the *pleonastic* constructions given above.

The uses of *usted* demand special notice. It may precede or follow its verb in the nominative, never separating the auxiliary verb and participle in compound tenses. Its oblique cases may be used instead of the possessive adjectives, and this construction is considered the more elegant in polite address. Thus, the phrase, "At your feet," may be rendered *á vuestros piés,* or *á los piés de V.*

Although regularly expressed, when subject of a verb, *usted* may be omitted: (1) when it has already been expressed, as a subject, in the same sentence; (2) when sufficiently close to its expression in a paragraph, to avoid ambiguity; or (3) in short sentences where no ambiguity could occur. In short sentences it may be replaced by its pronominal substitutes, provided that no ambiguity occur. Its substitutes, also, follow the rules for conjunctive pronouns, being suffixed to certain verbal constructions.

THE REFLEXIVE PRONOUN

The reflexive and reciprocal pronoun, *sí,* "self," is frequently used for the third personal pronoun and for *usted.* It is declined as follows in both numbers:

G. *de sí,* of himself (yourself)—selves.
D. *se—á sí,* to himself (yourself)—selves.
A. *se—á sí,* himself (yourself)—selves.
Pr. *sí,* himself (yourself)—selves.

THE DEMONSTRATIVES

The Spanish demonstrative adjectives, usually classed with pronouns, are:

(1.) *este, esta, esto,* this; PLURAL, *estos, estas;*
(2) *ese, esa, eso,* that; PLURAL, *esos, esas;*
(3.) *aquel, aquella, aquello,* that; PLURAL, *aquellos, aquellas;*
(4.) *el, la, lo,* that; PLURAL, *los, las;*
(5.) *aqueste, aquesta,* this; PLURAL, *aquese, aquesa;*
(6.) *estotro, estotra,* this other; PLURAL, *estotros, estotras;*
(7.) *esotro, esotra,* that other; PLURAL, *esotros, esotras;*
(8.) *aquel otro, aquella otra,* that other; PLURAL, *aquellos otros,* etc.

To briefly sum up the shades of meaning found in the use of these words, we may say that *este,* "this," designates something held by the speaker or near to him; *ese,* "that," something held by or near to the person addressed; *aquel,* "that," something remote from both. Thus, in referring to cities and places, the words, *en esta,* "in this," may be used with the meaning "here"; *en esa,* "in that," with the meaning "there." The same distinctions hold good in referring to places and times, at hand, or less or more remote. Thus, *esta calle,* "this street," indicates the one in which I live or the one of which I have just spoken; *esta calle,* "that street," the one inhabited by or mentioned by you; but *aquella calle,* "that street," one equally remote from both of us. Similarly, *este año,* "this year," refers to the present; *ese año,* "that year," to the one mentioned by the speaker, or within his recollection; *aquel año,* "that year," to a time far in the past, and beyond personal recollection. In short, *este,* may be translated by the English slang expression, "this here"; *ese,* by "that there." Consequently, *ese* is frequently used in the contemptuous sense of the English "that," emphatic, or the Latin *iste,* as in the expression, *el hombre ese,* "that man," or "that man there" ("that man of yours").

In ordinary discourse, the demonstrative adjectives precede their nouns, but, in lively or emphatic language, they follow the noun, which is properly preceded by the definite article.

The definite article, *el, la,* is used as a *demonstrative pronoun,* taking the case, gender, and number of the omitted noun to which it refers.

The demonstrative adjectives may be used as nouns, with the meaning of "this man" (or "woman"), "that man" (or "woman"),

or merely of "this one" or "that one." Similarly, the neuter forms, *esto, eso, aquello,* may refer to things, or may mean, respectively, "what I said," "what you said," "what has been said" by some one else, by some one or other, or in remote time. In all these secondary uses the distinctions of meaning hold good, as already specified.

THE POSSESSIVES

Like other languages, the Spanish distinguishes possessive adjectives, "my, thy, his," etc., and possessive pronouns, "mine, thine, his, ours," etc. In regard to the use of these, there are several peculiarities, which, however, have partial counterparts in English idioms.

The possessive adjectives have two forms, the *conjunctive* and the *absolute,* so called; the former preceding, and agreeing *in number* with, the noun, and the latter following, and agreeing in both *number* and *gender* with, the noun. In point of agreeing with the *thing possessed,* rather than with the *possessor,* the Spanish follows the rule laid down for Latin, French, German, and many other languages. The possessive adjectives, however, agree *in person* with the possessor, and their form indicates the *number.*

Briefly expressed, the *conjunctive* form of Spanish possessive adjectives corresponds to the ordinary construction of English; thus, "my book," "my friend." The absolute construction, on the other hand, is represented by the English expression "that —— of mine," etc., as in "that son of yours." This construction is found in poetical address, particularly in religious odes; thus, "Father of ours," etc. It also occurs in poetry and classic, or romantic, writing in such endearing forms as "baby mine," "husband mine." To further smplify the matter for the student, we may say that the absolute possessive, so-called, in Spanish, consists, as in the English corresponding construction, in using the possessive pronoun as an adjective.

THE ABSOLUTE POSSESSIVES

Since, in Spanish, the absolute possessive construction occurs much more frequently than in English, the conditions of its use must be definitely specified.

(1) It is used in both languages to admit the demonstratives, "this" or "that," in a possessive construction.

(2) It is used, as in English, in familiar and endearing terms, and in contemptuous expressions.

(3) With the first person, it is the regular form in *direct address,* except where the noun, *indicating the thing or person possessed,* is qualified by an adjective or past participle. In this latter case, either the conjunctive or absolute form may be used. Thus: *padre mio,* "my father," but *mi querido padre,* or *querido padre mio,* "my dear father."

(4) With impersonal nouns.

(5) With nouns used, as in English, in an indeterminate sense. Thus, "a friend of mine."

(6) Where special emphasis or rhetorical effect is desired.

In connection with the last head, however, it seems necessary to remark that the emphasis given in English by the word, "own," is similarly given in Spanish by *propio, propia.* Thus: *mi propio padre,* "my own father"; *mi propia madre,* "my own mother," etc. This construction always occurs with the conjunctive possessive adjectives.

Although the absolute forms of the possessive adjectives regularly follow a noun used with the definite or indefinite article—the former being used generally in the sense of the demonstrative, "that"—there are several cases, beside direct address, in which articles may be omitted.

(1) With idioms using prepositions; as, *á casa mia,* "at my house"; *á fé mia,* "on my word."

(2) When the noun is the predicate after the verb, "to be"; as, *Es amigo mio,* "He is a friend of mine."

The conjunctive possessives may be used with a noun governed by a demonstrative adjective, as also in English. Thus, we may say, "this thy brother," *este tu hermano;* "those your friends," *esos tus amigos.*

The possessive adjectives are given in the following list. The *conjunctives* indicating singular possessors have a common form for both genders: the *absolutes* vary for gender, as do, also, the *conjunctives indicating plural possessors,* except in the third person. Thus:

FIRST PERSONAL POSSESSIVES

CONJUNCTIVE.—"My," *mi* (SING.), *mis* (PLUR.). "Our," *nuestro, nuestra* (SING.), *nuestros, nuestras* (PLUR.).

ABSOLUTE.—"My," or "mine," *mio, mia* (SING.), *mios, mias* (PLUR.). "Our," or "of ours," *nuestro, nuestra* (SING.), *nuestros, nuestras* (PLUR.).

SECOND PERSONAL POSSESSIVES

CONJUNCTIVE.—"Thy," or "your," *tu* (SING.), *tus* (PLUR.). "Your," *vuestro, vuestra* (SING.), *vuestros, vuestras* (PLUR.).

ABSOLUTE.—"Thy," or "of thine," *tuyo, tuya* (SING.), *tuyos, tuyas* (PLUR.). "Your," or "of yours," *vuestro, vuestra* (SING.), *vuestros, vuestras* (PLUR.).

Where *usted* is used instead of the second personal pronoun, the third personal posessive occurs, as will be illustrated presently.

THIRD PERSONAL POSSESSIVES

CONJUNCTIVE.—"His, her, its," *su* (SING.), *sus* (PLUR.). "Their," *su* (SING.), *sus* (PLUR.).

ABSOLUTE.—"His, her, its, their," or "of his, of hers, of its, of theirs," *suyo, suya* (SING.), *suyos, suyas* (PLUR.).

The regular construction with the *conjunctive possessives* is to precede the noun, indicating the thing possessed, by the appropriate personal form, singular or plural. Thus, *mi padre,* "my father"; *mis padres,* "my parents"; *tu tio,* "thy uncle," *tu tia,* "thy aunt," *tus tios,* "thy uncles," or "thy uncle and aunt"; *su casa,* "his house," *sus casas,* "his houses," etc.

With the conjunctive third personal possessive, the regular rule, in order to indicate *gender* and *number,* is to use a pleonastic construction with the appropriate personal pronoun preceded by *de.* Thus, while the phrase, *su padre,* may mean "his, her, its, their (M. or F). or one's father," the pleonastic constructions, *su padre de él, —de ella, —de ellos,* or *—de ellas,* furnish the only available means for determining the gender and number of the possessing noun.

The second personal possessive adjectives, "thy" ("your") and "your" (PLUR.), are expressed by *su, sus,* in sentences of direct address containing *usted.* Thus, in such sentences, "your father," may be translated, *su padre; el padre de V.,* or *su padre de V.* Also, "your parents," *sus padres; los padres de V.,* or *de VV.;* or *sus padres de V.,* or *de VV.*

As in French, words indicating parts of the body and wearing apparel take the dative of the personal pronoun, instead of the possessive adjective, after verbs. Thus: *Besaron la mano á ella,* "They kissed her hand"; *Les tomo la ropa,* "He took their clothing." Also, as in French, when there is no doubt as to the identity of the possessor, the definite article alone is used. Thus: *El levantó la cabeza,* "He raised his head"; *Corto la mano,* "He cut his hand."

The possessive pronouns are the same as the absolute possessive adjectives, in both gender and number. They are regularly used with the definite article, and are declined with it in all cases. Thus, we have *el mio, la mia, los mios, las mias,* "mine," etc. In point of agreement, they refer to the thing possessed in gender, number, and case, and to the noun indicating the possessor or possessors in person and in the designation of number. Thus: *mis padres y los vuestros,* "my parents and yours"; *Este perro es el mio,* "This dog is mine."

In order to avoid ambiguity in the use of the third personal pronoun, distinguishing "his," "hers," "theirs," and in the use of this pronoun with *usted,* it may be replaced by the genitive of the proper personal. Thus, while in the sentence, *Esta casa es suya,* the gender and number of the noun, indicating the possessor or possessors, is uncertain, the sentence *Esta casa es de él,* or, *— de ella,* etc., is perfectly specific.

In several cases, the possessive pronouns may be used without the definite article.

(1) When predicative after the verb, "to be," either without a demonstrative pronoun, or, when the demonstrative is not emphatic. Thus: *Tuyo es el reyno,* "Thine is the kingdom." When the demonstrative adjective is used in merely stating a fact, about which there is no dispute, the article is omitted, as, *Esa casa es tuya,* "That house is yours." But, where there is a dispute, the article must be used, as, *Esa casa es la tuya, "This* house is yours."

(2) The article is omitted, when it has already been used with another possessive or with the genitive case of a noun. Thus: *Tomaron nuestra ropa la de mi padre y mia,* "They took my father's clothing and mine."

When the possessive pronouns are used substantively, *lo* (PLUR., *los*) is always found where the article should logically occur. Thus: *Tos mios y los tuyos,* "Mine and thine."

RELATIVE PRONOUNS

The relative pronouns are as follows:

quien, quienes, he who, those who;—*que,* that, who, which;
el (la) cual, los (las) cuales, who, which;
el (la) que, los (las) que, who, which;
cuyo, cuya, cuyos, cuyas, whose, of which.

The demonstrative adjective, *aquel, aquella,* and the definite article, *el, la,* are also used with *que,* to give the meanings "he who," "the one who," "those who," etc. Also, the meanings, "that which," and "what," are supplied by *lo que, lo cual,* and *aquello que.*

The pronoun, *que,* is used as the nominative of *quien,* when reference is to persons; in the other cases, except the accusative, it refers only to things and objects devoid of

natural sex. The declensions of these words, as used in the specified senses for both genders, are as follows:

Singular	
N. *que*	*que*
G. *de quien*	*de que*
D. *á quien*	*á que*
A. *á quien—que*	*que*
Pr. *quien*	*que*

Plural	
N. *que*	*que*
G. *de quienes*	*de que*
D. *á quienes*	*á que*
A. *á quienes—que*	*que*
Pr. *quienes*	*que*

The relative *quien* is used properly in referring to persons. Its nominative case is always *que* when its antecedent is a noun only, but may be given as *quien* when its antecedent is a noun in a clause making complete sense by itself. In these respects, *que* very nearly corresponds to the English "that," while *quien* corresponds to "which."

Thus, we say, *el hombre que,* "the man who" (or "that"), etc., but

La literatura nos vino de los Romanos, quienes (or *los cuales*) *han estado muy sabios,* "Literature came to us from the Romans, who were very wise."

On the other hand, *que* is very often used in such connections. Thus, from "Don Quixote":

Sancho salió á ver lo que mandaba Don Quijote, que estaba sentado sobre un poyo, "Sancho came out to receive the commands of Don Quixote, who had sat down upon a bench."

Although the form, *que,* is regularly used to refer to persons in the nominative and accusative cases, as we have already seen, it is used in the other cases with prepositions only when referring to things or animals. Thus, although there is no neuter gender in the Spanish language, a sharp distinction is always made between nouns denoting natural gender and those indicating things devoid of sex, or which have not proper personality.

The words *quien* and *que* are frequently displaced by *el cual* and *el que,* in places where it is desirable to avoid ambiguity, or where elegance demands that we avoid frequent repetition of *que,* either as a relative pronoun or as the conjunction "that." In both of those relatives the *el* is inflected like the personal pronoun, but *que* remains the same in all cases and in both numbers. *Cual* forms its plural *cuales* for both genders. When the reference is to a thought, idea, or to a preceding sentence, the form *lo cual* is used. When it is necessary to translate the English expression "what" and "that which," the form *lo que* is regularly used, if the reference is to an idea and not to a word.

The word *cuyo* is regularly used for the English relative "whose" or "of which." The feminine form is *cuya.*

The word *cuanto,* whose plural is *cuantos* or *cuantas,* according to gender, is regularly used where the English gives "as much" "as many," also for "all who," "all which," etc.

As in German, adverbs are sometimes used instead of oblique cases of pronouns. Thus, the adverb *donde,* "where," is regularly used with a preposition to express the idea of "by which," "for which," etc.

The interrogative pronouns are the same as the relatives except that they take an accent; *cúyo,* on the first syllable and the remainder on the last.

THE INDEFINITES

The indefinite pronouns and adjectives are numerous, but the most important are given in the following list:

AJENO, AJENA, "another's," or "of another," is used adjectively after a noun. Thus: *la esposa ajena,* "another's wife," and *el dinero ajeno,* "another's money." As a substantive with *lo,* it signifies, "what is another's." Followed by *de* and a noun, it means "alien to" or "foreign to." Thus, *ajeno de los Españoles,* "(something) foreign to Spaniards."

A'LGUIEN, "some one" or "anybody," is a pronominal substantive, used in about the same sense as the French *on* or the German *man,* and can not be used partitively. It may occur in any connection where the English would give "any one at all" or "some one or other."

ALGUNO, ALGUNA, "somebody," "anybody," may be used substantively to denote an indefinite person or thing, or, in a partitive construction, to denote a particular indefinite among a number of things or persons, as *alguno de ustedes,* "some one of you." As an adjective related to a noun, it indicates "some" or "any," and its masculine singular *apocopates.* Thus: *algun hombre,* "some man," but *alguna mujer,* "some woman." In the plural, the adjectival construction denotes both "some" and "a few."

ALGO means regularly "something" or "anything," and may be used alternately with *alguna cosa* (Fr. *chose*). Like the Ger-

man, *etwas*, it may be used adverbially, with the meaning of "somewhat" or "rather."

AMBOS, AMBAS, means "both," and may be used alternately with *entrambos, entrambas*, or with *los dos* (or *las dos*), "the two." Occasionally, we meet with *ambos á dos*, literally, "both the two."

CADA means "every," also "each," and may be used adjectively with nouns in either sense, or with plural nouns and numerals to signify "every two," "every three," etc. With the numeral, *uno, una*, "one," without a following noun, it may mean "any one," "each one," and may be used partitively; *cada uno de los hombres*, "each one of the men." With *cual*, also, it may mean "every one," "any one." "Every" may also be expressed by *todos los* (*las*), "all the"; *todos los hombres*, "every man."

CIERTO, CIERTA, "certain," if preceding the noun, without the indefinite article, means "a certain"; *cierto hombre*. If following the noun, it signifies "sure," "definite," "authentic."

CUALQUIERA, relating to persons or things, also means "whoever," also, "whoso" or "whosoever." Used substantively, and followed by *de*, it may mean "any of" or "either of." As an adjective, it means "any," when followed by a noun: with *cosa*, "a thing," it means "anything" or "whatever." Used as an adjective, in attributive agreement with a noun, it *apocopates;* thus, *cualquier cosa*. Since the suffix is a verbal form, the plural is made on the *cual;* thus, *cualesquiera*.

MISMO means "same." If used before a noun, with the definite article or a determinative adjective, it means "the, this, that same"; with the definite article, also, "the very"; with the indefinite article or the plural adjective, *unos, unas*, "one and the same," "the very same."

NADA means "nothing," or "not anything." It may be used with a verb, with or without the negation, *no;* the double negative in the former case serving to intensify rather than to neutralize the negation. It may be used *elliptically*, with the meaning "no more," with the verbs, "say," "do," etc., understood. Followed by *de*, it means "nothing of," or "no," and, following a verb, preceded by *no*, means "not—at all."

NADIE, "no one," "nobody," is the negative of *alguien*, and is used in exactly the same class of constructions.

NINGUNO is the negative of *alguno*, and is used in the same way.

PROPIO, PROPIA, "self," also "own," stands after personal and possessive pronouns and possessive adjectives. Thus, *tu propio* or *tu propia*, "thou, thyself"; *mi propia madre*, "my own mother."

QUIEN means "any one who," when followed by a verb in the indicative or subjunctive mood.

QUIENQUIERA means "whoever," or "any one whatever," but refers only to persons. Thus: *quienquiera que sea*, "whoever it be." The ending, *quiera*, is the subjunctive present second person of the verb, *querer*, "to wish, to want," and has the force of the English "you please," as in "any one you please."

SENDOS, "one by one," or "one for each," is used with plural nouns and verbs, and governing plural objects. Thus: *tenian las cuatro mujeres sendos hijos*, "the four women had each a child" (or "children, one for each").

TAL, "such a," may be used with nouns, but without the indefinite article, to indicate the given meaning. Thus, *tal hombre*, "such a man," in all cases. Without a noun it may mean "such a thing," subjectively or objectively. Preceded by the indefinite article and followed by a proper noun—the name of a person—it signifies "one" or "a certain."

TODO, "all," used adjectively and followed by a noun, means "every" in the singular and "all" in the plural. It may be used substantively, like the English "all"; as, *todo se concluyó*, "all is over" (*i.e.* "is finished"). In this use, it may also mean "anything," and may be used with relative pronouns, as in the English "all who" and "all of which," etc.

DECLENSION OF NOUNS

In declension, nouns remain invariable, prepositions being used in oblique cases, and terminations remaining unchanged. When preceded by an article, the article is regularly inflected according to the model already given; when not preceded by an article, the preposition immediately precedes the noun. Regular forms of the article are invariably used, except in the case of adjectives used substantively, when the so-called neuter article, *lo*, is employed.

All nouns in Spanish have either the masculine or feminine gender, as shown by the articles preceding them. While the matter of gender can not be treated fully in a few sentences, we may give some general rules for determining the question. Thus, the masculine gender belongs to all nouns denoting males; to most names of places and

rivers; to indeclinable words and phrases used substantively; to the names of most fruit trees and their wood, and, regularly, to all nouns ending in *o*.

The feminine gender belongs to all nouns designating females; to most nouns ending in *a;* to the names of fruits, flowers, all letters of the alphabet, etc.

All masculine nouns ending in *a* are the same when used to denote a corresponding feminine person or animal. All nouns ending in *o* form their corresponding feminines by changing *o* to *a*. All masculine nouns ending in *d, l, n, r, s, z,* form their corresponding feminines by adding *a*. Every masculine ending in *dor* or *tor* forms its feminine by changing the ending to *triz*.

These two nouns form their feminines by adding *esa: el abad,* "the abbot"; *el baron,* "the baron." These four add *sa: el alcáide,* "the warden"; *el alcalde,* "the mayor"; *el conde,* "the earl"; *el duque,* "the duke." These four add *isa* to the stem to form the feminines, dropping the final vowel in each instance: *el diácono,* "the deacon"; *el poeta,* "the poet"; *el profeta,* "the prophet"; *el sacerdote,* "the priest."

The plurals of Spanish nouns are regularly formed by adding *s* or *es*. The letter *s* is assumed by all nouns ending in unaccented vowels, except *y*, and by all nouns ending in accented *é*. The ending *es* is assumed for the plural of all nouns ending in a consonant—*z*, however, always becoming *c;* by all nouns ending in *y* and by all accented vowel endings, except *e*.

Certain nouns remain unchanged in the plural. Such are those ending with unaccented *is* and *es;* family names in *s* and *z* and most technical and industrial terms derived direct from Latin. The compound words not already plural, add the proper plural endings to the last word only.

Nouns ending in *e,* when not derived from Latin participles, generally change the ending *e* to *a* in forming their feminines. Thus, *el monje,* "the monk," *la monja,* "the nun"; *el sastre,* "the tailor," *la sastra,* "the tailoress," etc. However, nouns ending in *ante, ente, iente,* may either remain unchanged in the feminine or add *a,* according to the above rule. Very many proper names form their feminines irregularly, as in most other languages; so, also, do a number of common nouns, such as: *el hombre,* "the man," and *la mujer,* "the woman"; *el marido,* "the husband," and *la esposa,* "the wife"; *el caballero,* "the gentleman," and *la dama,* "the lady," etc.

The words, "male" (*macho*), and "female" (*hembra*), followed by *del* or *de la,* are often used to designate gender in some Spanish nouns, which are regularly masculine or feminine, and do not change their terminations.

ADJECTIVES

As a general rule, the Spanish adjectives are formed like nouns; the feminine forms being derived according to the rules already given for nouns. They must agree in gender and number with the nouns accompanying them, in either relative or absolute constructions.

Among adjectives that form their feminines in a more or less irregular manner are diminutives ending in *ote,* which change the final *e* into *a*. All others ending in *e* remain unchanged in the feminine. Proper adjectives and diminutives ending with *in* add *a* in the feminine, but all other adjectives ending with *in* remain unchanged in the feminine. Proper adjectives ending in *és* (accented) add *a* to the masculine and drop the accent in forming the feminine, but all common adjectives with this termination remain unchanged in the feminine. This is true, also, with all common adjectives ending in *es* (unaccented). A few adjectives ending in *tor* form their feminine with the ending *triz*.

In addition to the class of adjectives already mentioned, the masculines and feminines are the same with all those ending in *á, é, í* (accented); *al, el, ie, ul, en, in, un, ar, az, ez, iz, oz;* all adjectives having the termination *ista,* indicating social, religious, and other affiliations; and all comparatives in *or* and *yor*.

APOCOPATION

Although the regular rule requires an adjective to have its proper ending for gender and number, when used in agreement with any noun, several adjectives in *o* suffer what is known as *apocopation;* which is to say they drop the *o* when used attributively. These adjectives are as follows:

alguno, some, any	*postrero,* latter, last
bueno, good	*primero,* first
malo, bad	*tercero,* third
ninguno, some, any	*uno,* one.

Although in adjectives in this class the masculine form only is so varied, popular usage frequently *apocopates* the feminine singular, particularly before nouns beginning with *a* and *ha*. *Apocope* is very often applied to the numeral adjective *uno, una,* particularly when used attributively.

Among other cases of *apocopation* may be mentioned the adjective *grande,* which regularly drops its final syllable *de* before the singular nouns beginning with any other consonant than *h.* While this adjective regularly precedes its noun in an attributive construction, it invariably follows the noun unaltered when it refers to physical dimensions in the sense of the English words "large" and "big." However, it retains its full form, even before nouns beginning with a consonant, when used in an intensive or emphatic sense, particularly with the particle *tan,* "so." The adjective, *cualquiera,* drops the *a* when immediately preceding its noun; the adjectives, *ciento,* "one hundred," and *santo,* "holy," regularly drop the *to;* the former before nouns, the latter when used with the meaning of "Saint." Thus, we have *San Juan,* St. John, and *San Pablo,* St. Paul. When used with the meaning "holy," *santo* is never contracted, and the feminine *santa* always maintains its full form. Thus, we have *Santa Maria,* St. Mary, and *Santa Ines,* St. Agnes.

POSITION OF ADJECTIVES

Although an adjective may either precede or follow the noun in the attributive construction, those subject to *apocope,* and the several others, regularly precede their nouns. The same rule applies to a few other adjectives, which may be given as follows:

As a general rule, the adjective follows the noun, unless the language is poetical, emphatic, or figurative. This rule applies particularly to:

(1.) Participial adjectives ending in *ado, ido, ante, ente, iente,* and *yente;*

(2.) Proper adjectives derived from personal and geographical names;

(3.) Common adjectives ending in *al, dor, tor;*

(4.) All diminutives and augmentatives;

(5.) Regularly, all adjectives of more than two syllables.

A plural noun, governed by two or more singular adjectives, always precedes the adjectives.

As in French, several adjectives vary in meaning between physical and moral qualities, according as they precede or follow their nouns. Among these may be mentioned the following:

MAL preceding means, "poor," "unfortunate"; following, "wicked," "bad," "vicious."

GRANDE preceding means "great" in a figurative sense; following, "large," "big."

NUEVO preceding, "different"; following, "new," "recent."

NEGRO preceding, "dark," in a figurative sense; following, "black," in the actual sense.

VARIOS preceding, "various"; following "miscellaneous."

POBRE preceding, "poor," in the sense of exciting pity or contempt"; following, "poor," as indicating poverty.

CIERTO preceding, "certain," as, "a certain man," etc.; following, "sure," "reliable."

SANTO preceding means "sacred," in general; following, it indicates some particular sacred thing or person. Thus, *el santo padre,* "the holy father" (the priest); but *el padre santo,* a popular designation for the Pope. Also, *un santo campo,* "a sacred field"; but *un campo santo,* "a cemetery."

COMPARISON OF ADJECTIVES

The comparison of adjectives is regularly accomplished, as in French, by the use of words indicating "more" or "less" for the comparative, and the same words preceded by the definite article or the demonstrative *lo* for the superlative. Thus, the words indicating the comparative degree are *mas,* "more," and *menos,* "less"; the superlative being formed by preceding the comparative with *el, la,* and *lo.*

The superlative formed with *mas* or *menos* and the definite article is called the relative superlative. There is, however, another form known as the absolute superlative, which is formed by adding the suffix *isimo,* for the masculine, *isima,* for the feminine, and forming the plural of both according to regular rules. It may also be formed by preceding the adjective in the positive degree with such adverbs as *muy, bien, harto, sumamente,* and *excessivamente.*

In adding the superlative suffixes, *isimo, isima,* etc., to the stem of the adjective, it may follow directly after any consonant except *z,* but involves changing the final stem consonant *c* into *cu, g* into *gu,* and *z* into *c,* according to the rules already given for altering a consonant sound preceding a weak vowel. Similarly, it rejects the final vowel or true diphthong, and changes the movable diphthongs *ie* and *ue* into their simple vowels *e* and *o.*

The absolute superlative is used in constructions where the definite article is not found, and as an alternative form has its analogue in the German superlative absolute, constructed with the dative case and preposition.

Although the comparison of adjectives is

governed by the regular rules already laid down, a few adjectives, as in French, also, are compared, as in Latin, by adding *or* (or *yor*) to the stem of a word of similar meaning. A few of these are as follows:

Bueno, good; *mejor,* better; *óptimo* (rare), best.

Malo, bad; *peor,* worse; *pésimo* (rare), worst.

Grande, great; *mayor,* greater; *maximo* (rare), greatest.

Pequeño, small; *menor,* smaller; *mínimo* (rare), smallest.

While the regular rules for the relative superlative require the use of the definite article or possessive adjective preceding it—always when standing in a predicate clause after the verb "to be," when agreeing with the subject of the verb—it may, however, be used without the article, when in direct agreement with a noun preceded by the article. Thus, the relative superlative is often expressed by the formal comparative, that is when neither the adjective nor noun has an article; and is used where the English gives the comparative in sentences directly comparing two persons or things.

LIST OF ADJECTIVES

large	*grande*	granday
small	*pequeño*	payken'yo
good	*bueno*	booayno
bad	*malo*	mahlo
much	*mucho*	moochoh
little	*poco*	pocoh
high	*alto*	ahlto
short	*bajo*	bahoh
less	*menos*	maynos
more	*mas*	mahs
greater *or* larger	*mayor*	mahyor
smaller	*menor*	may'nor
worse	*peor*	pay'or
better	*mejor*	mayhor
superior	*superior*	soopayreeor
inferior	*inferior*	inferee'-or
cold	*frio*	freeoh
warm	*calor*	cahlor
rich	*rico*	reecoh
poor	*pobre*	poh-bre
long	*largo*	largoh
new	*nuevo*	nooayvo
old	*viejo*	veeayho
young	*joven*	hovayn
great	*gran* or *grande*	gran *or* granday
near	*cerca*	thayrka
wide	*ancho*	ahncho
hard	*duro*	dooroh
soft	*blando*	blahndo
stupid	*estupido*	aystoopeedo
clever	*listo* or *hábil*	leesto *or* ahbeel
clean	*limpio*	leempeeoh
dirty	*sucio*	sootheeo
polite	*cortes*	cortays
impolite	*impolitico*	impoleeteecoh
weak	*debil*	daybeel
strong	*fuerte*	booayrtay
false	*falso*	fahlsoh
narrow	*angosto*	ahngosto
deep	*hondo*	ohndo
round	*redondo*	raydondo
fresh	*fresco*	frayscoh
ripe	*maduro*	mahdooroh
sour	*agrio*	ahgreeo
green	*verde*	vayrday
sweet	*dulce*	doolthay
tender	*tierno*	teeayrno
sad	*triste*	treestay
gay	*alegre*	ahlaygray
happy	*feliz*	fayleeth
unhappy	*desgraciado*	daysgratheeahdo
thin	*delgado*	daylgahdo
fat	*gordo*	gordoh
ill	*enfermo*	aynfayrmo
prudent	*prudente*	proodentay
imprudent	*imprudente*	improodentay
handsome	*hermoso*	ayrmosoh
ugly	*feo*	fay'oh
graceful	*gracioso*	gratheeosoh
pretty	*bonito*	boneetoh
affable	*afable*	ahfahblay
noble	*noble*	noblay
amiable	*amable*	ahmahblay
harsh	*áspero*	aspayroh
sacred	*sagrado*	sahgrah-do
free	*libre*	leebray
brave	*valiente*	valeeayntay

VERBS

The Spanish verb, although conjugated and used differently from the English, and frequently subject to a number of troublesome irregularities, is simple in theory and readily learned. Like the verbs of English, French, and German, it has two classes of tenses—simple and compound—the former constructed by varying the stem endings, the latter, by combining inflections of the auxiliary verb, "to have," with the past participle of the main verb. The passive voice is also formed by combining inflections of the auxiliary verb, "to be," with the past participle of the main verb.

For the sake of convenience, the Spanish verb may be divided into five moods—*infinitive, indicative, subjunctive, conditional,* and *imperative.* The form, translated by the so-called "present participle" in other languages, is called the *gerund* in Spanish, and has two tenses, present and past, both invariable in gender and number in all uses. The *participles* are also present and past.

The Indicative Mood has four simple tenses—*present, imperfect, preterit* (or *past definite*), and *future;* four compound tenses—*perfect* (or *past indefinite*), *pluperfect, past anterior,* and *future perfect.*

The Subjunctive Mood has three simple tenses—*present, imperfect, future*—two forms for the *imperfect* being recognized; and three compound tenses—*perfect* (or *past indefinite*), *pluperfect, future perfect*—two forms for the *pluperfect* being recognized.

THE CONDITIONAL MOOD, as we may call it, has two tenses—the *present* and the *past*. The first is used in the second part of conditional sentences after either form of the *imperfect subjunctive*, with "if," etc.; the second, after either form of the *pluperfect subjunctive*, similarly modified.

THE AUXILIARY VERBS

The Spanish language is peculiar in one respect: the auxiliary verbs, "to have" and "to be," represent words entirely different from those used in other constructions. Thus: "have," the auxiliary, is *haber;* while "have," in the sense of "possess" or "hold," is *tener*. "Be," the auxiliary, is *ser;* while "be," in the sense of "exist," "remain," etc., is *estar*. Neither *tener* nor *estar* is used as an auxiliary, nor in connection with verbs, except in idiomatic constructions.

The verb *haber*, being used only as an auxiliary in forming the compound tenses of other verbs, has neither compound tenses of its own, nor an imperative mood. It is inflected, as follows:

THE AUXILIARY VERB HABER, "TO HAVE"

INFINITIVE PRESENT
haber, to have

GERUND
habiendo, having

PAST PARTICIPLE
habido, had

INDICATIVE	SUBJUNCTIVE
Present	
I have, *he*	I may have, *haya*
thou hast, *has*	thou mayest have, *hayas*
he has, *ha*	he may have, *haya*
we have, *hemos*	we may have, *hayamos*
you have, *habeis*	you may have, *hayais*
they have, *han*	they may have, *hayan*
Imperfect	*First Imperfect*
I had, habia	I might have, *hubiera*
thou hadst, *habias*	thou mightest have, *hubieras*
he had, *habia*	he might have, *hubiera*,
we had, *habiamos*	we might have, *hubiéramos*
you had, *habiais*	you might have, *hubiéreis*
they had, *habian*	they might have, *hubieran*
Preterit	*Second Imperfect*
I had, *hube*	I might have, *hubiese*
thou hadst, *hubiste*	thou mightest have, *hubieses*
he had, *hubo*	he might have, *hubiese*
we had, *hubimos*	we might have, *hubiésemos*
you had, *hubisteis*	you might have, *hubiéseis*
they had, *hubieron*	they might have, *hubiesen*
Future	
I shall have, *habré*	(if) I shall have, (*si*) *hubiere*
thou wilt have, *habrás*	(if) thou wilt have, (*si*) *hubieres*
he will have, *habrá*	(if) he will have, (*si*) *hubiere*
we shall have, *habrémos*	(if) we shall have, (*si*) *hubiéremos*
you will have, *habréis*	(if) you will have, (*si*) *hubiéreis*
they will have, *habrán*	(if) they will have, (*si*) *hubiéren*

CONDITIONAL MOOD
Present

This form makes the *past conditional* of verbs with the *past participle*, which stands in the *apodosis* of a conditional sentence, with either form of the *pluperfect*, formed by either form of the *imperfect* of *haber* and the *past participle* of the proper verb, preceded by *si* (if), etc.

I should have, *habria*
Thou wouldst have, *habrias*
He would have, *habria*
We should have, *habriamas*
Ye would have, *habriais*
They would have, *habrian*

In order to fix the difference between the two verbs, "to have," in the student's mind, and, at the same time, to illustrate the use of parts of *haber* in the formation of compound tenses, the conjugation of the irregular verb, *tener*, will be given.

INFINITIVE MOOD
Present
tener, to have

Perfect
haber tenido, to have had

GERUND
teniendo, having

PAST PARTICIPLE
tenido, had

INDICATIVE	SUBJUNCTIVE
Present	
I have, *tengo*	I may have, *tenga*
thou hast, *tienes*	thou mayest have, *tengas*
he has, *tiene*	he may have, *tenga*
we have, *tenemos*	we may have, *tengamos*
you have, *teneis*	you may have, *tengais*
they have, *tienen*	they may have, *tengan*
Imperfect	*First Imperfect*
I had, *tenia*	I might have, *tuviera*
thou hadst, *tenias*	thou mightst have, *tuvieras*
he had, *tenia*	he might have, *tuviera*,
we had, *teniamos*	we might have, *tuviéramos*
you had, *teniais*	you might have, *tuviérais*
they had, *tenian*	they might have, *tuvieran*

Indicative	Subjunctive
Preterit	*Second Imperfect*
I had, *tuve*	I might have, *tuviese*
thou hadst, *tuviste*	thou mightst have, *tuviéses*
he had *tuvo*	he might have, *tuviese*
we had, *tuvimos*	we might have, *tuviesemos*
you had, *tuvisteis*	you might have, *tuviéseis*
they had, *tuvieron*	they might have, *tuviesen*

Future

I shall have, *tendré*	(if) I shall have, (*si*) *tuviere*
thou wilt have, *tendrás*	(if) thou wilt have, (*si*) *tuvieres*
he will have, *tendrá*	(if) he will have, (*si*) *tuviere*
we shall have, *tendrémos*	(if) we shall have, (*si*) *tuviéremos*
you will have, *tendréis*	(if) you will have, (*si*) *tuviereis*
they will have, *tendrán*	(if) they will have, (*si*) *tuvieren*

Perfect or Past Definite

I have had, *he tenido*	I may have had, *haya tenido*

Pluperfect

I had had, *había tenido*	I might have had, *hubiera tenido*, or *hubiese tenido*

Past Anterior

I had had, *hube tenido*

Future Perfect

I shall have had, *habré tenido*	I should have had, *hubiere tenido*

Conditional Mood

Present

I should have, *tendria*
thou wouldst have, *tendrias*
he would have, *tendria*
we should have, *tendriamos*
you would have, *tendriais*
they would have, *tendrian*

Perfect

I should have had, *habria tenido*, etc., etc.

Imperative Mood

1, let me have, *tengo yo*
2, have thou, *ten tú*
3, let him have, *tenga él*
1, let us have, *tengamos*
2, have ye, *tened*
2, have you, *tengan Vds.*
3, let them have, *tengan*

THE PASSIVE VOICE

The passive voice of all transitive verbs is formed by combining the past participle of the verb with conjugations of the auxiliary, *ser*, "to be," which is never used with any active verbal form. In the use of the past participle in forming the passive voice, the terminations are regularly formed, to suit the gender and number of the subject, precisely as with adjectives used predicatively. Thus: *es amado*, "he is loved"; *es amada*, "she is loved"; *somos amados*, "we (M.) are loved"; *son amadas*, "they (F.) are loved."

In using the verb "to be," it is necessary to distinguish carefully and constantly between the passive auxiliary, *ser*, and the verb, *estar*, used to express "existence" in general, and never used with the passive, nor as an auxiliary in the proper sense of the word. The two verbs are conjugated, as follows:

CONJUGATION OF THE VERBS "TO BE"

Present Infinitive

To be

Ser Estar

Gerund

Being

Siendo Estando

Past Participle

Been

Sido Estado

Indicative		Subjunctive	
I am, etc.		*I may be*, etc.	
		Present	
Soy	Estoy	Sea	Esté
Eres	Estas	Seas	Estes
Es	Está	Sea	Esté
Somos	Estamos	Seamos	Estemos
Sois	Estais	Seais	Esteis
Son	Estan	Sean	Esten
Imperfect		*First Imperfect*	
I was, etc.		*I would be*, etc.	
Era	Estaba	Fuera	Estuvieras
Eras	Estabas	Fueras	Estuviera
Era	Estaba	Fuera	Estuviéramos
Eramos	Estábamos	Fuéramos	Estuviérais
Erais	Estábais	Fuérais	Estuvieran
Eran	Estaban	Fueran	Estuviera
Preterit		*Second Imperfect*	
I was, etc.		*I should be*, etc.	
Fui	Estuve	Fuese	Estuviese
Fuiste	Estuviste	Fueses	Estuvieses
Fué	Estuvo	Fuese	Estuviese
Fuímos	Estuvimos	Fuésemos	Estuviésemos
Fuísteis	Estuvisteis	Fuéseis	Estuviéseis
Fuéron	Estuviéron	Fuesen	Estuviesen
Future			
I shall be, etc.		*When I shall be*, etc.	
Seré	Estare	Fuere	Estuviere
Serás	Estarás	Fueres	Estuvieres
Será	Estará	Fuere	Estuviere
Serémos	Estarémos	Fuéremos	Estuviéremos
Seréis	Estaréis	Fuéreis	Estuviéreis
Serán	Estarán	Fueren	Estuvieren

Indicative	Subjunctive
Perfect or Past Indefinite	
I have been, etc.	*I may have been,* etc.
he sido or estado	haya sido or estado
has sido or estado	hayas sido or estado
ha sido or estado	haya sido or estado
hemos sido or estado	háyamos sido or estado
habeis sido or estado	háyais sido or estado
han sido or estado	hayan sido or estado
Pluperfect	*First Pluperfect*
I had been, etc.	*I might have been,* etc.
habia sido or estado	hubiera sido or estado
habias sido or estado	hubieras sido or estado
habia sido or estado	hubiera sido or estado
habíamos sido or estado	hubiáramos sido or estado
habíais sido or estado	hubiérais sido or estado
habian sido or estado	hubieran sido or estado
Past Anterior	*Second Pluperfect*
I had been, etc.	*I might have been,* etc.
hube sido or estado	hubiese sido or estado
hubiste sido or estado	habieses sido or estado
hubo sido or estado	hubiese sido or estado
hubimos sido or estado	hubiésemos sido or estado
hubísteis sido or estado	hubiéseis sido or estado
hubieron sido or estado	hubiesen sido or estado
Future Perfect	
I shall have been, etc.	*(If) I should have been,* etc.
habré sido or estado	hubiere sido or estado
habrás sido or estado	hubieres sido or estado
habrá sido or estado	hubiere sido or estado
habrémos sido or estado	hubiéremos sido or estado
habréis sido or estado	hubiéreis sido or estado
habrán sido or estado	hubieren sido or estado

Conditional Mood

Present		*Past*
I would be, etc.		*I would have been,* etc.
Seria	Estaria	habria sido or estado
Serias	Estarias	habrias sido or estado
Seria	Estaria	habria sido or estado
Seriamos	Estariamos	habriamos sido or estado
Seríais	Estaríais	habrias sido or estado
Serian	Estarian	habrian sido or estado

Imperative Mood

Let me be, etc.

Sea	Esté
Se	*Está*
No seas	No estes
Sea	Esté
Sea V.	Esté V.
Seamos	Estemos
Sed	Estad
No seais	No esteis
Sean	Esten
Sean VV.	Esten VV.

USES OF SER AND ESTAR

When the verbs, *ser* and *estar,* "to be," are used with other words than parts of verbs, as expressing state or existence, idiom prevents their interchange in practically all cases. This fact gives rise to several *shades* of meaning, which must seem somewhat strange to the average English-speaking student. Thus, *ser* always indicates a fact or state that is *permanent* or *essential;* while *estar* indicates what is merely *temporary, transitory,* or *accidental.* Examples are, as follows: *El fuego es caliente,* "Fire is hot" (indicating a permanent quality); *El agua está caliente,* "The water is hot" (indicating that it is in one of several possible states). Also: *Soy Español,* "I am a Spaniard"; *Estoy en España,* "I am [now] in Spain."

The distinction involved in the use of these words naturally modifies the meanings of many adjectives, when used predicatively after the one or the other. Among these we may mention the following:

Bueno, (1) after *ser,* "good"; (2) after *estar,* "well" (in good health).

Malo, (1) after *ser,* "bad"; (2) after *estar,* "ill" (in poor health).

Alto, (1) "tall"; (2) "high up."

Triste, (1) "stupid"; (2) "sad."

Cansado, (1) "tiresome"; (2) "tired."

Callado, (1) "discreet" or "taciturn"; (2) "silent."

Loco, (1) "crazy"; (2) "frantic."

USES OF THE TENSES

While in the greater number of cases the several moods and tenses of the Spanish verbs are used very much like the corresponding parts in English, there are several points that demand at least passing mention.

The Indicative Mood states facts that actually exist, that have existed, or that will exist, and is never used in any construction expressing contingency or uncertainty. There is, however, considerable latitude in the use of the several tenses of this mood, as in English and most other languages. Thus, the present tense, in addition to expressing facts represented as occurring at the time of speaking, also indicates, (a) habit, custom, and permanent conditions; (b) is used instead of the future in familiar language; (c) replaces the past definite (preterit) in lively narration; (d) is used idiomatically after a clause with the impersonal verb *hace,* "it is." These usages are virtually reproduced in English, thus, with the Spanish we say, "I go at once," instead of, "I will go." We also say, in lively narration, "He comes up and speaks to me," or, "He says, thus and so," instead of using the past tense. The idiom giving the present tense after the impersonal verb, "it is," is far less common in English; thus we always say,

"Have you been waiting long?" while the Spanish says, "Is it long that you waited?"

THE IMPERFECT TENSE, as in French, denotes continued action in the past, and is really equivalent to the English progressive conjugation, giving "was" with the present participle of the verb. It may even be rendered by a perfectly similar construction in Spanish. As a consequence it indicates either, (a) some incident that was in process at the time referred to, or (b) that was customary in a time before the present. It may also indicate the absolute past, properly denoted by the preterit in vivid narrations, either when the action expressed is represented as occupying more or less time, or in expressing what occurred during a definite past period. In this sense it is always used to state who or what a certain person was. Thus we say "Alexander was king of Greece," which is rendered in Spanish by *Alejandro era rey de Grecia.*

THE PRETERIT OR PAST DEFINITE indicates action occurring on one occasion of the past, and is almost always used in historical narrations, except when the idea of repetition, custom, or long duration is involved.

THE PERFECT OR PAST INDEFINITE indicates, (a) what actually occurred in the past, without reference to any particular period; (b) what is occurring in time, not yet wholly elapsed. Thus we also say, "I have returned to-day," or, "I have been ill this week."

THE PLUPERFECT TENSE is used precisely as in English, as expressing some action or condition already completed at a past time referred to.

THE PAST ANTERIOR TENSE, which is always formed with the preterit of the verb, "to have," and the past participle of the main verb, expresses the same idea as the pluperfect, but is always preceded by conjunctions of *time*, such as *cuando*, "when"; *despues que*, "after"; *huego que, asi que, tan pronto como*, "as soon as"; *no bien*, "no sooner"; *apenas*, "scarcely."

THE FUTURE TENSE, in addition to denoting future time, as in English, is also used idiomatically, (a) to denote possibility—thus where we say, "Can such a thing be?" the Spanish says, "Will it be?"; (b) it is used for the present sense, when some doubt is involved as to the object, manner, or reason of obvious action, or where the English would use "I wonder," "I suspect," "perhaps," etc.; (c) it indicates also willingness, consent, or refusal, as in English.

THE CONDITIONAL MOOD, as already stated, is used principally in the *apodosis* of conditional sentences, which is to say, in the clause stating the conclusion following a condition expressed by "if" or "when" in the *protasis*. The present conditional may follow either form of the imperfect subjunctive, and the past conditional, either form of the pluperfect subjunctive. The conditional is also used, (a) as in English, to express conclusion in sentences where the *protasis* is implied, understood, or logically to be assumed as existing—thus, we say "I would not do such a thing"; (b) it is used to indicate a statement somewhat uncertain, or only approximate, in the sense of the English "about"—thus, "It is about 2 o'clock," or "He is about twenty years old"; (c) it also expresses possibility or fitness in the sense of the English auxiliaries "could," "should," "ought," etc.; (d) with prepositions expressing desire or wish, it indicates a modest or respectful request, such as is introduced by the English "might"; (e) it is used, like the simple imperfect of the subjunctive, in a dependent clause expressing indirect discourse, etc.

THE SUBJUNCTIVE MOOD, as in several other languages, and in classic English, is used in two principal ways: (a) as the proper tense for a subordinate clause, indicating indirect discourse, and introduced by a conjunction; (b) independently, to express command, particularly in the third person, or to supply the absence of the imperative form, to express wishes—thus, "Would God," "God grant," "Would that," etc.; (c) to express possible alternatives, such as are represented by the English "whether—or not."

In a subordinate clause the subjunctive follows a preposition expressing doubt, denial, questioning, hope, fear, expectation, command, desire, advice, permission, grief, surprise, regret, and after impersonal expressions in general. It follows in any construction that may properly be introduced by the conjunction, "that," in English. The subjunctive also follows conjunctions in sentences expressing possibility, uncertainty, and indefinite futurity; such as, *ántes que*, "before," *como* and *cuando*, "when," *para que*, "in order that," *miéntras*, "while," etc.

The subjunctive is also used in relative sentences, (a) expressing negative ideas; (b) referring to things unknown or indefinite. Thus, *No hay quien lo crea*, "There is no one who believes that."

THE INFINITIVE MOOD is used as a verbal

noun, like the English participle ending in *ing*, in practically all cases except where the gerund properly occurs. In some cases, also, it is used alternately with the gerund. The infinitive mood is, thus, used (a) after all prepositions, and (b) with the definite article, as expressing abstract ideas or the actions indicated by the verb. Thus, *El saber es indispensable*, "Knowledge is indispensable."

With prepositions expressing command, causing, hindering, forbidding, wishing, fearing, desiring, pretending, etc., the infinitive follows without a preposition. It is preceded by the preposition, *á*, when the verb indicates motion or definite direction, also with many reflexive verbs, expressing moral assertion, etc., such as daring, resolving, attempting, refusing, resisting, etc. It is preceded by the preposition, *de*, after nouns and adjectives, properly followed by the genitive, and after verbs of remembering, forgetting, rejoicing, repenting, ceasing, attempting, being about to, being busy, etc.

Other prepositions precede the infinitive, as follows: *en*, when the idea is expressed in English by the preposition "in," followed by the participle in *ing;* by *con*, when the same participle in English is preceded with "by"; by *para*, in expressing purpose, result, use, etc.; by the preposition, *por*, in the sense of result, reason, willingness.

THE GERUND is one of the most familiar parts of the Spanish verb being used in several important constructions. It is most frequently used like the English present participle in *ing*, instead of a verbal clause introduced by "when," etc. Thus: "Turning to his friend, he added," *Volviendo se á suyo amigo, anadio*, etc. The gerund is often used with prepositions expressing progressive or continued action, as a substitute for such a relative clause as "Those who were doing." It is also used as the English present participle with "while, by, in," as "while working," etc., *trabajando;* "by pretending," *aparentando;* "in doing," *haciendo*. The gerund may also be used with prepositions, being then equivalent to "when or if one has," etc., in English. Thus: *En habiendo dinero*, etc., "When one has money," etc. The most notable use of the gerund is in forming the so-called "progressive conjugation," as already explained.

REGULAR VERBS

The regular verbs in Spanish are divided into three conjugations, distinguished, as in Latin, according to the characteristic vowel of the *present infinitive* ending. Thus, all verbs with the infinitive ending in *ar* belong to the first conjugation; all, in *er*, to the second; all, in *ir*, to the third.

Since the paradigms of the irregular auxiliary verbs, *haber* and *ser*, with those of *tener* and *estar*, have already been given, it will be unnecessary to do more than to add a few general rules for the formation of the tenses of regular verbs.

THE PRESENT INDICATIVE first person of all regular verbs ends in *o*, with the second person *as* or *es*, and the third person *a* or *e*, according to the conjugation determined by the ending of the *present infinitive*.

THE PRESENT SUBJUNCTIVE first person may be formed by changing the *o* of the *present indicative* to *e* in the first declension, and to *a* in the second and third declensions; making the second and third persons *es* and *e*, or *as* and *a*, accordingly.

THE SUBJUNCTIVE IMPERFECT of both terminations may be formed from the *third person singular preterit indicative* by dropping the *o*, and adding *ara* and *ase* in the *first persons* of the *first conjugation*, and *esa* and *ese* in the *first persons* of the *second* and *third conjugations*, forming *iera* and *iese* respectively.

THE CONDITIONAL PRESENT may be formed from the *future indicative first person*, by dropping the final *e*, and adding *ia* in all conjugations; thus forming *aria, eria*, and *iria*, respectively.

The list of endings shown in the following table are suffixed either to the stem or the *present infinitive* form of the verb. The *stem* of any verb may be found by dropping the *ar, er*, or *ir* of the infinitive.

The tenses formed from the *stem* are the *indicative* and *subjunctive present* and *imperfect;* the *indicative preterit;* the *subjunctive future* and the *imperative*. Thus: from *amar*, "to love," we have, *amo*, "I love"; *ame*, "I may love"; *amaba*, "I was loving"; *amara* or *amase*, "I might love"; *amé*, "I did love"; *amare*, "(that) I shall love."

The tenses formed by adding the personal endings direct to the form of the *present infinitive* are the *indicative future* and the *conditional present*. Thus: *amaré*, "I shall love," and *amaria*, "I should love."

Close study of the following table of tense endings will show that, while, in the *first conjugation*, the *first imperfect* and *future subjunctive* appear to be derived direct from the present infinitive form, the rule already given is most convenient for forming these tenses in the *second* and *third* conjugations.

TENSE TERMINATIONS OF VERBS

THREE DECLENSIONS

INFINITIVE MOOD

	Present	*Gerund*	*Past Participle*
1st Conjugation	AR,	ANDO,	ADO.
2d "	ER,	IENDO,	IDO.
3d "	IR,	IENDO,	IDO.

INDICATIVE MOOD

Present

	(*Yo.*)	(*Tú.*)	(*El.*)	(*Usted.*)	(*Nosotros.*)	(*Vosotros.*)	(*Ellos.*)	(*Ustedes.*)
1st Conj.	(ar)—o,	as,	a,	a,	amos,	ais,	an,	an.
2d "	(er)—o,	es,	e,	e,	emos,	eis,	en,	en.
3d "	(ir)—o,	es,	e,	e,	imos,	is,	en,	en.

Imperfect

1st Conj.	(ar)—aba,	abas,	aba,	aba,	ábamos,	ábais,	aban.	aban.
2d "	(er)—ia,	ias,	ia,	ia,	íamos,	íais,	ian,	ian.
3d "	(ir)—ia,	ias,	ia,	ia,	íamos,	íais,	ian,	ian.

Preterit

1st Conj.	(ar)—é,	áste,	ó,	ó,	ámos,	ásteis,	aron,	aron.
2d "	(er)—í,	íste,	ió,	ió,	ímos,	ísteis,	ieron,	ieron.
3d "	(ir)—í,	íste,	ió,	ió,	ímos,	ísteis,	ieron,	ieron.

Future *

1st Conj.	(ar)—aré,	arás,	ará,	ará,	arémos,	aréis,	arán,	arán.
2d "	(er)—eré,	erás,	erá,	erá,	erémos,	eréis,	erán,	erán.
3d "	(ir)—iré,	irás,	irá,	irá,	irémos,	iréis,	iran,	iran.

SUBJUNCTIVE MOOD

Present

1st Conj.	(ar)—e,	es,	e,	e,	émos,	éis,	en,	en.
2d "	(er)—a,	as,	a,	a,	ámos,	áis,	an,	an.
3d "	(ir)—a,	as,	a,	a,	ámos,	áis,	an,	an.

Imperfect, First Termination

1st Conj.	(ar)—ara,	aras,	ara,	ara,	áramos,	árais,	aran,	aran.
2d "	(er)—iera,	ieras,	iera,	iera,	iéramos,	iérais,	ieran,	ieran.
3d "	(ir)—iera,	ieras,	iera,	iera,	iéramos,	iérais,	ieran,	ieran.

Imperfect, Second Termination

1st Conj.	(ar)—ase,	ases,	ase,	ase,	ásemos,	áseis,	asen,	asen.
2d "	(er)—iese,	ieses,	iese,	iese,	iésemos,	iéseis,	iesen,	iesen.
3d "	(ir)—iese,	ieses,	iese,	iese,	iésemos,	iéseis,	iesen,	iesen.

Future

1st Conj.	(ar)—are,	ares,	are,	are,	áremos,	áreis,	aren,	aren.
2d "	(er)—iere,	ieres,	iere,	iere,	iéremos,	iéreis,	ieren,	ieren.
3d "	(ir)—iere,	ieres,	iere,	iere,	iéremos,	iéreis,	ieren,	ieren.

CONDITIONAL MOOD

Present *

1st Conj.	(ar)—aría,	arías,	aría,	aría,	aríamos,	ariais,	arian,	arian.
2d "	(er)—ería,	erías,	ería,	ería,	eríamos,	eriais,	erian,	erian.
3d "	(ir)—iria,	irías,	iria,	iria,	iríamos,	iriais,	irian,	irian.

IMPERATIVE MOOD

1st Conj.	(ar)—e,	a,	e,	e,	emos,	ad,	en,	en.
2d "	(er)—a,	e,	a,	a,	amos,	ed,	an,	an.
3d "	(ir)—a,	e,	a,	a,	amos,	id,	an,	an.

* The student will notice that the syllables *ar, er,* or *ir* in the endings of these cases represent the final syllables of the *present infinitive*, on which the endings seem to be formed.

PRONOMINAL VERBS

There are numerous verbs, of perfectly regular conjugation in English, that are found in the so-called "pronominal" or "reflexive" conjugation in Spanish. Such verbs are given with the third personal pronoun, *se,* suffixed to the present infinitive, and are conjugated through all persons and numbers with the proper personal pronouns. Thus: from *figurase,* "to imagine," we have the present conjugation, *me figuro, te figuras, se figura, nos figuramos, os figurais, se figuran;* all other moods and tenses being similarly constructed. The compound tenses take conjugations of *haber,* with the personal pronouns, as: *me he figurado, te has figurado, se ha figurado,* etc.

As with the regularly conjugated verbs, reflexives take subject-pronouns in emphatic or interrogative sentences. The subject-pronoun, however, always precedes all the other verb-elements in the emphatic construction, and comes last in the interrogative. In neither case can it come between the reflexive object-pronoun and the verbal form. Thus: *Yo me figuro,* "I imagine"; *¿Me figuro yo?* "Do I imagine?"; *Yo no me figuro,* "I do not imagine"; *¿No me figuro yo?* "Do I not imagine?"

Although some verbs occur only in the reflexive form, while others derive a different signification when it is used, any transitive verb may be used reflexively, as in English, when the action is represented as having the same person or thing as its logical subject and object. If the verb in question regularly governs the accusative, the reflexive pronoun-object is in the accusative: if it takes the dative of the person and the accusative of the thing, the reflexive pronoun-object is in the dative.

The regular conversational forms are indicated in the examples already given; but literary usage generally makes the pronoun-object a suffix to the personal forms of the verb in the simple tenses, and of the auxiliary in the compound tenses, when the verb begins a sentence or clause. Thus: *figurame* or *figurame yo,* "I imagine"; *heme figurado* or *heme figurado yo,* "I have imagined."

The impersonal form of the reflexive verbs and conjugation frequently occurs with permanently reflexive Spanish verbs. This form takes the word *se,* "self," in addition to the pronoun of the proper person, running through the entire conjugation of all moods and tenses with the third person singular of the verb. Thus, instead of the forms already given, we may have; *se me figura, se te figura se le figura, se nos figura, se os figura, se les figura;* "I imagine," "thou imaginest," etc., literally, "It imagines itself to me,—to thee,—to him," etc., etc.

This impersonal reflexive form in the third person, singular or plural, furnishes the Spanish equivalent for the English, "They say"; "They tell me," etc., in the sense that, "I am told"; "They ordered him," etc., when the logical subject is indeterminate.

The widest use of the reflexive conjugation is as a substitute for the passive voice, which is very generally avoided in modern Spanish. Thus, as in French, very many nouns indicating things are given with the reflexive, rather than the passive, conjugation. "The book is published," becomes, "The book publishes itself," *El libre se publique:* also, "Money was made" (or "made itself"), *El dinero se ganó.* Instead of saying "Spanish is spoken here," we find the conventional reflexive expression, *Aquí se habla Español,* "Here Spanish speaks itself."

The impersonal reflexive may also be used as a substitute for the passive voice. Thus: "I have been deceived," *se me ha engañado* ("it has deceived itself to me"); "I am not believed," *no se me cree* ("it does not believe itself to me").

THE PROGRESSIVE CONJUGATION

A verbal idiom of considerable importance is the so-called "progressive conjugation," formed by associating the gerund of the verb with conjugations of *estar,* "to be"; occasionally, also, with conjugations of the verbs, *ir* or *andar,* "to go"; *seguir,* "to go on"; *quedar,* "to remain"; *verse,* "to see one's self"; *hallarse* or *encontrarse,* "to find one's self." The nearest idiomatic translation into English may be found in our progressive conjugation, as in "I am going"; "He was coming," etc. In short, the gerund, with any of the above verbs, as an auxiliary, may be taken to form any tense of any verb, as with the English idiom just mentioned.

VERBAL IDIOMS

In very many cases, the Spanish verb is used, as in English, with auxiliary forms expressing obligation, willingness, or immediate attention. Thus, the infinitive is used in a number of such expressions with conjugations of the verb *haber,* "to have," followed by the preposition *de;* meaning

"to have to"; "to be about to"; "to be willing to"; also "must," in the sense of contingent certainty. Accordingly, the Spanish clause, *he de ir,* may mean, either, "I have to go"; "I am to go," or "I am willing to go."

Similarly, the verb, *tener,* "to have," followed by the conjunction, *que,* also indicates "to have to"; "to be obliged to"; also, "what remains," etc. Thus, the familiar method of saying, "We must speak," is, *Tenemos que hablar.* Similarly, in rendering such sentences, as, "What have you to say?" the Spanish has, *¿Que tiene V. que decir?* Here the emphasis is indicated by the expression of the pronoun, "you," *usted* (*V.*).

Similarly, the verb, *ir,* "to go," followed by the preposition, *á,* indicates, "to be about to do anything." Thus, "I am going to visit him," *Voy á visitarle.* The English expression, "to be about to do anything," may also be rendered in Spanish by conjugations of the verb, *estar,* "to be," followed by *para,* with the infinitive. Thus, *Está para decir,* "He is about to speak."

EUPHONIC CHANGES IN VERBS

In a large number of Spanish verbs the formation of the various tenses involves certain changes in the root, for the sake of making euphonious combinations with the various endings. These may be divided into the following separate heads:

(1) Verbs that change the final consonant of the root, in order to maintain the proper characteristic pronunciation before a vowel of a different class in the tense ending.

(2) Verbs that change the vowel in the last syllable of the root, without changing the consonant.

The first of these classes are subject to "regular euphonic changes," so-called because occurring in all verbs of a given class. The second are called "irregular," because occurring only in some of the verbs not affected by the first rules.

REGULAR EUPHONIC CHANGES

In forming the various tenses of a given verb, the rules for the variation of consonants before vowels, weak and strong, must be rigidly observed. This is particularly important, since there are no exceptions to the rules already laid down for guidance in this particular.

The most important principles of regular euphonic vowel-change may be summed up as follows:

(1) All verbs of the *first conjugation* ending in *car, gar, zar*—their stems ending in *c, g,* or *z*—change these letters to *qu, gu,* or *c* before *e* beginning a tense ending suffixed to the stem. Thus, from *tocar,* "to touch," we have PRES. IND., *toco,* "I touch," PRES. SUB., *toque,* "I may touch"; from *llegar,* "to arrive," PRES. IND., *llego,* PRES. SUB., *llegue;* from *alcanzar,* "to reach," PRES. IND., *alcanzo,* PRES. SUB., *alcance.* However, with personal endings beginning with strong vowels, the original stem-letter is retained, as shown in the following preterits: (1) *toqué,* (2) *tocaste, tocó;* (1) *llegué,* (2) *llegaste,* (3) *llegó;* (1) *alcancé,* (2) *alcanzaste,* (3) *alcanzó.*

(2) Verbs of the *first conjugation* with stems in *gu,* forming *present infinitives* in *guar,* take a dieresis over the *u* (thus *ü*) before stem-terminations beginning with *e.*

(3) Verbs of the *second* and *third conjugations,* with stems ending in *c,* change *c* to *z* before stem-terminations beginning with *a* or *o,* provided the *c* be preceded by a *consonant.* Thus, from *vencer,* "to overcome," we have *venzo, venza,* etc.; from *esparcir,* "to scatter," *esparzo, esparza,* etc. When the stem-consonant, *c,* is preceded by a *vowel,* the stem is strengthened, before stem-terminations beginning in *a* or *o,* by inserting *z* before it. Thus, from *carecer,* "to lack," we have *carezco, carezca,* etc.; from *lucir,* "to show," *luzco, luzca,* etc.

(4) Verb-stems of the *second* and *third declensions* ending in *g*—giving *ger* and *gir*—have *j* before the strong vowels *a* and *o.* Thus, from *coger,* "to gather," we have *cojo, coja,* etc.

(5) Verb-stems of the *third declension* ending in *gu* and *qu*—giving *guir* and *quir*—have the radical hard *g* or *c* before stem-terminations beginning in *a* or *o.* Thus, from *seguir,* "to follow," we have *sigo, siga,* etc.; from *delinquir,* "to transgress," *delinco, delinca,* etc.

(6) Verb-stems of the *second* and *third conjugations,* ending in *ll, ñ,* and some in *ch,* absorb the *i* of *ie* and *io* of stem-terminations, as in the *gerund, preterit, subjunctive imperfects,* and *future.* Thus, from *bullir,* "to boil," we have *bullendo, bulló* (*ió*), and *bullera* (*iera*); from *tañer,* "to play, to sport," *tañendo, tañó* (*ió*), *tañera* (*iera*). This seems natural; since both *ll* and *ñ* have a consonant *y*-sound following. With verbs in *ch,* there are generally two forms, one contracted, the other un-

contracted. Thus, from *henchir*, "to fill," we have either *hinchendo* or *hinchiendo*, etc.

(7) Verb-stems of the *second conjugation* ending in *e*, giving *eer* in the *present infinitive*, retain the radical *e* and change the *i* of stem-terminations into *y*. Thus, from *poseer*, "to possess," we have *poseyendo, poseyó, poseyese, poseyere*, etc.

(8) Many verb-stems of the *third conjugation* ending in *u*, giving *uir* in the *present infinitive*, retain the radical *u* before stem-terminations beginning with *ie* and *io*, and change the *i* to *y*. Thus, from *instruir*, "to instruct," we have *instruyendo, instruyó*, etc.

Such verb-stems also give *y* before the stem-terminations *a, e*, and *o*. Thus: from *instruir*, we have, *instruyo, instruye, instruya*, etc.

IRREGULAR VERBS

The primary use of the term, irregular verb, in Spanish, indicates one that changes or suppresses certain letters in its root in certain tenses and persons. In a second sense, the term indicates a verb that, as in other languages, has irregular terminations in some of its tenses.

There are about five hundred and fifty irregular verbs in Spanish, and of these over five hundred form their irregularities on certain general rules; the remainder showing irregularities peculiar to themselves and their compounds.

The verbs showing general irregularities may be classed under five heads:

(1) Verbs in all three conjugations, having *e* in the penult of the *present infinitive*, that change the *e* to *ie* in the *imperative*, and in the first, second, and third persons singular and the third person plural of the *present indicative* and *present subjunctive*.

(2) Verbs in all three conjugations, having *o* in the penult of the *present infinitive*, that change the *o* to *ue* in the *imperative*, and in the first, second, and third persons singular, and in the third person plural of the *present indicative* and *present subjunctive*.

(3) Verbs of the *third conjugation*, having *e* in the penult of the *present infinitive*, that change the *e* to *i* in the *imperative*, and in the first, second, and third persons singular, and in the third person plural of the *present indicative* and *present subjunctive*.

(4) Verbs of the *third conjugation*, having *e* in the penult of the *present infinitive*, that change the *e* to *i* in the *gerund*, and in all tenses and persons having terminations beginning with *o, e, a, ie, io*.

(5) Verbs, having the root, *duc*, that change the *c* to *j* in the *indicative preterit* and in the *first* and *second imperfects* of the *subjunctive*.

In the following list of verbs commonly met in ordinary conversation, those subject to any of the irregularities of vowel-combination just noted are followed by numbers indicating the rules covering their cases in parentheses. Those subject to special peculiarities, such as apply only to themselves, their derivatives and a few very similar verbs, are marked with the letter s in parentheses.

VERBS

to acquire	*adquirir*
to walk	*andar*
to seize	*asir*
to hit	*acertar* (1)
to encourage	*alentar* (1)
to grasp	*apretar* (1)
to stuff	*atestar* (1)
to agree	*acordar* (2)
to observe	*advertir* (1)
to ascribe	*atribuir*
to argue	*argüir*
to advise	*aconsejar*
to bless	*bendecir* (s)
to drink	*beber*
to jump	*brincar*
to fall	*caer*
to boil	*cocer, hervir*
to conceive	*concebir* (1)
to believe	*creer*
to shut	*cerrar* (1)
to give	*dar*
to say	*decir* (s)
to sleep	*dormir* (s)
to err	*errar*
to begin	*empezar* (1)
to understand	*entender* (1)
to make	*hacer* (s)
to trample	*hollar* (2)
to flee	*huir*
to go	*ir* (s)
to intervene	*intervenir* (s)
to infer	*inferir* (1)
to institute	*instituir*
to impose	*imponer* (s)
to play	*jugar*
to swear	*jurar*
to build	*fabricar*
to fail	*faltar*
to fry	*freir*
to fortify	*fortalecer*

to die	*fallecer*
to force	*forzar* (2)
to favor	*favorecer*
to govern	*gobenar* (1)
to moan	*gemir* (1)
to exclaim	*gritar*
to grunt	*gruñir*
to till	*labrar*
to read	*leer*
to shine	*lucir*
to liquidate	*liquidar*
to raise	*levantar*
to rain	*llover*
to cry	*llorar*
to measure	*medir* (3)
to bite	*morder* (2)
to die	*morir* (5)
to move	*mover* (2)
to show	*mostrar* (2)
to grind	*moler* (2)
to support	*mantener* (1)
to ride a horse	*montar*
to curse	*maldecir* (s)
to declare	*manifestar* (1)
to deserve	*merecer*
to mark	*marcar*
to chew	*mascar*
to snow	*nevar* (1)
to deny	*negar* (1)
to be born	*nacer*
to swim	*nadar*
to narrate	*narrar*
to offer	*ofrecer*
to obey	*obedecer*
to hear	*oir* (s)
to smell	*oler* (s)
to obstruct	*obtsruir*
to darken	*obscurecer*
to oppose	*oponer* (s)
to obtain	*obtener* (s)
to produce	*producir* (5)
to prove	*probar* (2)
to put	*poner* (s)
to profess	*profesar*
to fold	*plegar* (1)
to please	*pacer*
to pervert	*pervertir* (1)
to think	*pensar* (1)
to utter	*proferir* (1)
to ask, to beg	*pedir* (3)
to lose	*peder* (1)
to burn	*quemar*
to stay	*quedar*
to wish	*querer* (1)
to break	*quebrar* (1)
to take away	*quitar*
to recommend	*recomendar* (1)
to lean against	*recostar* (2)
to refer	*referir* (1)
to remind	*recordar* (2)
to reduce	*reducir* (5)
to laugh	*reir* (s)
to mend	*remendar* (1)
to yield	*rendir* (3)
to repeat	*repetir* (3)
to examine int	*requerir*
to entreat	*rogar* (2)
to gnaw	*roer* (s)
to breathe	*resollar* (2)
to renew	*renovar* (2)
to relapse	*recaer* (s)
to reconstruct	*reconstruir*
to recognize	*reconocer*
to reprimand	*reconvenir*
to sprinkle	*regar* (1)
to glitter	*relucir*
to remove	*remover* (2)
to relish	*saborear*
to roll	*rodar* (2)
to rot	*podrir* (s)
to prefer	*preferir*
to appear	*parecer*
to perish	*perecer*
to last	*permanecer*
to pale	*palidecer*
to suffer	*padecer*
to populate	*poblar* (2)
to possess	*poseer*
to postpone	*posponer* (s)
to prevail	*prevalecer*
to proceed	*proceder*
to prevent	*prevenir* (s)
to foresee	*prever* (s)
to promote	*promover* (2)
to pursue	*proseguir*
to propose	*proponer* (s)
to provide	*proveer*
to arise	*provenir* (s)
to presuppose	*presuponer* (s)
to foresee	*presentir* (3)
to imprison	*prender*
to present	*presentar* (1)
to premeditate	*premeditar*
to reward	*premiar*
to predominate	*predominar*
to preach	*predicar*
to foretell	*predecir* (4)
to go out	*salir* (s)
to serve	*servir* (3)
to satisfy	*satisfacer*
to know	*saber* (s)
to feel	*sentir* (4)
to sanctify	*santificar*
to suggest	*sugerir* (4)
to follow	*seguir*
to smile	*sonreir* (s)
to sow	*sembrar* (1)
to sustain	*sostener* (s)
to substitute	*substituir*
to suppose	*suponer* (s)

to dye	*teñir* (4)
to twist	*torcer* (8)
to translate	*traducir* (5)
to tremble	*temblar* (1)
to bring	*traer* (8)
to stumble	*tropezar* (1)
to touch	*tentar* (1)
to transfer	*transferir*
to transplant	*transplantar*
to come	*venir* (8)
to see	*ver* (8)
to dress	*vestir* (4)
to return	*volver* (2)
to fly	*volar* (2)

FAMILIAR IRREGULAR VERBS

Since the irregularities of Spanish verbs are numerous and complicated, it will be possible to give only a few samples, as follows:

ANDAR, to walk; *indic. pret.*, anduve, anduviste, anduvo, anduvimos, anduvísteis, anduviéron.

ASIR, to seize; *indic. pres.*, asgo, ases, ase, asimos, asis, asen.

CABER, to be contained in; *indic. pres.*, quepo, cabes, cabe, etc.; *indic. pret.*, cupe, cupiste, cupo, etc.; *indic. fut.*, cabré, cabrás, cabrá, etc.; *subj. pres.*, quepa, quepas, quepa, quepamos, quepais, quepan.

CAER, to fall; *indic. pres.*, caigo, caes, cae, etc.; *indic. pret.*, caí, caiste, cayó, etc.; *subj. pres.*, caiga, caigas, etc.

DAR, to give; *indic. pres.*, doy, das, da, damos, dais, dan; *indic. pret.*, dí, diste, dio, dimos, disteis, dieron; *indic. fut.*, daré, darémos; *subj. pres.*, dé, etc.

DECIR, to say; *gerund*, diciendo; *past part.*, dicho; *indic. pres.*, digo, dices, dice, decimos, decis, dicen; *indic. imperf.*, decia, etc.; *indic. pret.*, díje, dijiste, etc.; *indic. fut.*, diré, dirás, dirá, etc.

DORMIR, to sleep; *gerund*, durmiendo; *past part.*, dormido; *indic. pres.*, duermo, etc.; *pret.*, dormí, dormiste, durmió.

HACER, to make; *gerund*, haciendo; *past part.*, hecho; *indic. pres.*, hago, haces, etc.; *pret.*, hice, hiciste, hizo, hicímos, hicisteis, hiciéron.

IR, to go; *gerund*, yendo; *past part.*, ido; *indic. pres.*, voy, vas, va, vamos, vais, van; *imperf.*, ibe, ibas, iba, etc.; *pret.*, fuí, fuiste, fué, fuímos, fuísteis, fuéron; *indic. fut.*, iré, irás, irá, irémos, iréis, irán; *subj. pres.*, vaya, vayas, vaya, váyamos, váyais, vayan; *subj. imperf.*, fuera and fuese, *cond. pres.*, iria.

OIR, to hear; *gerund*, oyendo; *past part.*, oido; *indic. pres.*, oigo, oyes, oye, oimos, ois, oyen; *pret.*, oi, oiste, oyo, oímos, oísteis, oyéron; *fut.*, oiré, etc.

PONER, to put; *gerund*, poniendo; *past part.*, puesto; *indic. pres.*, pongo, pones, etc.; *pret.*, puse, pusiste, puso, etc.; *cond. pres.*, pondria, pondrias, etc.; *subj. pres.*, ponga, pongas, etc.

REIR, to laugh; *gerund*, riendo or riyendo; *past part.*, reido; *indic. pres.*, rio, ries, rie, reimos, reis, rien; *imperf.*, reia, etc.; *pret.*, reí, reiste, rió or riyó, reímos, reísteis, rieron or riyéron; *fut.*, reiré, etc., *subj. pres.*, ria, rias, ria, etc.

SABER, to know; *gerund*, sabiendo; *past part.*, sabido; *indic. pres.*, se, sabes, etc.; *imperf.*, sabia, etc.; *pret.*, supe, supiste, supo, etc.; *subj. pres.*, sepa, sepas, sepa, etc. Other *subjunctive* cases have the root, *sup;* the *conditional*, the root, *sab.*

SALIR, to go out; *gerund*, saliendo; *past part.*, salido; *indic. pres.*, salgo, sales, etc.; *imperf.*, salia, etc.; *pret.*, sali, etc.; *subj. pres.*, salga, salgas, etc.

TRAER, to bring; *gerund*, trayendo; *past part.*, traido; *indic. pres.*, traigo, traes, etc.; *imperf.*, traia, etc.; *pret.*, trajo, etc.; *subj. pres.*, traiga, traigas, etc.

VENIR, to come; *gerund*, veniendo; *past part.*, venido; *pres. indic.*, vengo, vienes, viene, venimos, venis vienen; *pret.*, vine, veniste, vino, venímos, venísteis, viníeron; *fut.*, vendra, etc.; *subj. pres.*, venga, vengas, venga, etc. Other *subjunctive* tenses have the root *vin*, the *conditional*, the root *vend.*

VER, to see; *gerund*, viendo; *past part.*, visto; *pres. indic.*, veo, ves, ve, vemos, veis, ven; *imperf.*, veia, etc.; *pret.*, ví, viste, vió, etc.; *fut.*, vere, etc.; *subj. pres.*, vea, veas, vea, etc.

ADVERBS

inside	*dentro*
outside	*fuera*
forward	*adelante*
before	*delante*
back	*atras*
up	*arriba*
to-day	*hoy*
to-morrow	*mañana*
late	*tarde*
early	*tamprano*
whilst	*mientras*
still, yet	*aun*
never	*nunca, jamas*
behind	*detras*

upon	*encima*
whereto	*adonde*
wherefrom	*de-donde*
quick	*presto*
within	*adentro*
abroad, outside	*afuera*
perhaps	*acaso*, *tal vez*, *quizas*
yes	*si*
no	*no*
neither	*tampoco*
already	*ya*
slowly	*despacio*
easily	*facilmente*
ordinarily	*ordinariamente*
frequently	*frequentemente*
grammatically	*gramaticalmente*
frankly	*fracamente*
near	*cerca*
far	*léjos*
here	*aquí*
there	*allí*
where	*donde*
yonder	*allá*
there	*ahí*
now	*ahora*
afterward	*luégo*
soon	*pronto*
always	*siempre*
well	*bien*
badly	*mal*
tall, loud	*alto*
low	*bajo*
so, as	*tan*
very	*muy*
much	*mucho*
how much	*cuanto*
enough	*bastante*
little	*poco*
before	*antes*
after	*despues*

EASY AND FAMILIAR EXPRESSIONS

MISCELLANEOUS

Yes, sir	*Si, señor*
No, sir	*No, señor*
Yes, madam	*Si, señora*
No, madam	*No, señora*
Yes, miss	*Si, señorita*
No, miss	*No, señorita*
If you please	*Si V. gusta*
Not at all	*No hay de que*
How do you do	*¿Como esta V.?*
Very well	*Muy bien*
It is warm	*Hace calor*
It is cold	*Hace frio*
It is cool	*Hace fresco*
It is very warm	*Hace mucho calor*
It is very cold	*Hace mucho frio*
Good-morning, good-day	*Buenos dias*
Good-night, Good-evening	*Buenas noches*
Good-afternoon	*Buenas tardes*
Thanks	*Muchas gracias*
I am obliged to you	*Yo agradezco*
I am very glad	*Me alegro mucho*
I understand	*Yo entiendo*
A cup of coffee	*Una tasa de café*
A glass of milk	*Un vaso de leche*
I am hungry	*Tengo hambre*
I am thirsty	*Tengo sed*
Good-by	*Adios*
I am very sorry	*Yo siento mucho*
That is terrible	*Eso es terrible*
I congratulate you	*Felicito á V.*
You are very kind	*Es V. muy bueno*
What a pity	*¡Que lástima!*
That is impossible	*Eso es imposible*
It is incredible	*Es increible*
I am astonished	*Estoy sorprendido*
I am angry	*Estoy enfadado*
I wish it so	*Yo lo quiero así*
I detest you	*Yo lo detesto á V.*
Give me some meat	*Déme carne*
Give me some fish	*Déme pescado*
Give me some rice	*Déme arroz*
Give me some beans	*Déme frijoles*
Give me some cheese	*Déme queso*
Give me some water	*Déme agua*
Give me some wine	*Déme vino*
I am tired	*Estoy cansado*
Do you speak English?	*¿Habla V. el Inglés?*
Do you speak French?	*¿Habla V. el Francés?*
Do you speak Spanish?	*¿Habla V. el Español?*
What do you speak?	*¿Que habla V.?*
I speak English	*Hablo el Inglés*
I speak French	*Hablo el Francés*
I speak Spanish	*Hablo el Español*
I speak a little	*Hablo un poco*
I know a little	*Sé un poco*

AGE

How old are you?	*¿Que edad tiene V.?*
I am fifteen	*Yo tengo quince años*
How old is your mother	*¿Que edad tiene su madre?*
How old is your father?	*¿Que edad tiene su padre?*

He does not show his age	*No representa su edad*
He never grows old	*Nunca envejece*
She is a young woman	*Es una mujer jóven*
She does not look it	*No lo parece*
He is older than he looks	*Es mas viejo dè lo que parece*
How old is your son?	*Qué edad tiene su hijo?*
I am not as young as I look	*No soy tan joven como paresco*
I believe you to be about forty years old	*Creo que V. tendrá unos cuarenta años*
Not so much	*No tanto*
Your father is fifty years old and he looks like a man of thirty	*Su padre tiene cincuenta años y parece un hombre de treinta*
He is a young man and looks like an old man	*Es un joven y parece un viejo*
I feel young	*Me siento joven*
I feel old	*Me siento viejo*
Be young and gay	*Sea joven y alegre*

ANGER AND SURPRISE

Who would have believed it!	*¡Quien lo hubiera creido!*
I doubt that to be true	*Dudo que eso sea verdad*
Is it possible?	*¿Es posible?*
Are you quite sure?	*Esta V. bien seguro?*
I am ashamed	*Estoy avergonzado*
What a shame!	*Que vergüensa!*
He has tired out my patience	*Me tiene cansada la paciencia*
I am disgusted	*Estoy disgustado*
I am tired of you	*Estoy cansado de V.*
What a pity!	*¡Que lastima!*
What an impertinence!	*¡Que impertinencia!*
If you don't do as I tell you, you shall be punished	*Si no haces lo que te digo, te castigo*
You are very troublesome	*Eres muy majadero*
Enough of your foolishness	*Basta de tonterias*
How impertinent you are!	*¡Que impertinente éres!*
Don't answer me	*No me contestes*
I am dissatisfied with you	*No estoy satisfecho de V.*
It does not seem true	*Parece mentira*
Silence!	*¡Silencio!*
What!	*¡Que!*

THE TABLE

The table is ready	*La mésa está lista*
Serve the dinner	*Sirva la comida*
Will you have some soup?	*¿Quiere V. sopa?*
The fish is very nice	*El pescado está muy bueno*
The vermicelli soup was very nice	*La sopa de fideos estaba muy buena*
I had a very fine breakfast this morning	*Esta mañana tuve un buen almuerzo*
I ate some lamb chops and fried potatoes	*Comi unas costillas de cordero y papas fritas*
Would you like to have your dinner at six o'clock	*¿Desearia V. comer á las seis?*
Whenever you please	*Cuando V. guste*
The roast beef is very nice	*La carne asada está muy buena*
Do you like roast mutton?	*¿Le guesta á V. el carnero asado?*
I like it very much	*Me gusta mucho*
This lobster salad is very rich	*Esta ensalada de langosta está muy rica*

ORDERING MEALS

Bring me a plate of soup	*Tráigame un plato de sopa*
Give me a napkin	*Déme una servilleta*
A clean plate	*Un plato limpio*
Bring me some fried oysters	*Tráigame ostiones fritos*
Bring me a bottle of red wine	*Tráigame una botella de vino tinto*
The tablecloth on this table is very dirty	*El mantel de esta mesa está muy sucio*
Please bring the knives and forks	*Sirvase traer los cuchillos y tenedores*
Bring me a spoon	*Tráigame una cuchara*
Bring me two wine glasses	*Tráigame dos vasos para vino*
Do you want salt and pepper?	*¿Quiere V. sal y pimienta?*
No, but I want some vinegar	*No, pero quiero vinagre*
Do you want some lettuce salad?	*¿Quiere V. ensalada de lechuga?*
Do you want some rice and beans?	*¿Quiere V. arroz y frijoles?*
I want some boiled eggs	*Quiero huevos pasados por agua*
Would you like some dessert?	*¿Quiere V. postres?*
No, sir, I want a cup of coffee	*No, señor, quiero una tasa de café*

GREETING, VISITING, ETC.

I am glad to see you	*Me alegro de verle*
How have you been?	*¿Como ha estado V.?*
I have been very well	*He estado muy bien*
How is your wife?	*¿Como está su señora?*
She does not feel well	*Ella no se siente bien*
How is your sister?	*¿Como está su hermana?*
How is your brother John?	*¿Como está su hermano Juan?*
He is well	*El está bien*
It is a long time since I have seen you	*Hace mucho tiempo que no he visto á V.*
I have been in England	*He estado en Inglaterra*
I am very busy and I have to leave you	*Estoy muy ocupado y tengo que dejarlo*
Until I see you again	*Hasta otra vista*
Remember me to your wife	*Mis recuerdos á su señora*
It is a very warm summer	*Hace un verano muy caluroso*
This winter is too cold	*Este invierno es demasiado frio*
We are having a beautiful spring	*Tenemos una primavera hermosa*
Why don't you visit us more frequently?	*¿Porqué no nos visita con mas frequencia?*
Yes, I will do so in the future	*Si, lo haré en lo sucesiro*
Bring your sister with you	*Traiga á su hermana con V.*
I will do so	*Asi lo haré*
Have you been to the theatre lately?	*¿Ha estado V. en el teatro ultimamente?*
I went to the opera last Wednesday	*Fui á la opera el Miércoles pasado*
Did you like the singing.	*¿Le gustó á V. el canto?*
I was very pleased with it	*Me agradó mucho*
Have you heard from your son?	*¿Ha tenido V. noticias de su hijo?*
Yes, sir, he writes me often	*Si, señor, el me escribe amenudo*
How is your business?	*¿Qué tal está su negocio?*
Quite dull	*Bastante flojo*
They will improve later	*Mejorarán después*
Pray, be seated	*Sirvase sentarse*

MORNING

I am going to have my breakfast very early	*Voy á tomar el almuerzo muy temprano*
Every morning I take a walk in the park	*Todas las mañanas tomo un paseo por el párque*
What did you do yesterday morning?	*¿Qué hizo V. ayer por la mañana?*
I went to the post-office, and afterward answered a letter that I received from my father	*Fui al correo, y después contesté una carta que recibir de mi padre*
Sunday morning I have to take my wife to church	*El Domingo por la mañana tengo que llevar á mi señora á la iglesia*
The morning air is very wholesome	*El aire de la mañana es muy saludable*
I walk two miles every morning	*Camino dos millas todas las mañanas*
The morning is quite cool	*La mañana está bastante fresca*
At what time do you wish to rise?	*¿A que hora quiere V. levantarse?*
I want to be called at five o'clock in the morning	*Quiero que me llámen á las cinco de la mañana*
Do you like to sleep in the morning?	*¿Le gusta á V. dormir la mañana?*
Sometimes I like it	*Algunas véces me gusta*
I work during the night and sleep in the morning	*Trabajo durante la noche y duermo la mañana*
If I don't sleep in the morning, I arise all tired out	*Si no duermo la mañana, me levanto cansado*
I was up very early	*Me leventé muy temprano*
I had a cold bath this morning	*Tomé un baño de agua fria esta mañana*
I prefer a warm water bath	*Prefiero el baño de agua caliente*

AFTERNOON, EVENING, AND NIGHT

I wish to go to bed	*Deseo acostarme*
At what time do you go to bed?	*¿A que hora se acuesta V.?*
Some nights earlier than others	*Algunas noches mas temprano que otras*
I rest well during the night	*Descanso bien durante la noche*

This afternoon I am going to take a walk	*Esta tarde voy á tomar un paseo*
Yesterday afternoon I went to see my mother	*Ayer tarde fui á ver á mi madre*
I intend to go to the theatre this evening	*Piénso ir al teatro este noche*
Last evening I saw my brother at the hotel	*Anoche ví á mi hermano en el hotel*
The evenings are very cool	*Las noches son muy fréscas*
Last night I slept very badly	*Anoche dormí muy mal*
To-morrow afternoon I intend to call on a good friend	*Mañana en la tarde pienso ir á visitar á un buen amigo*
I am sleepy	*Tengo sueño*
Are you sleepy?	*¿Tiene V. sueño?*
Let us go to the ball	*Vamos al baile*
The bed is ready	*La cama está lista*
These sheets are not very clean	*Estas sabanas no están muy limpias*
It is not my fault, the washer-woman brought them so	*No es culpa mia, la lavandera las trajo así*
This evening I am very tired	*Esta noche estoy muy cansado*
It is time to go to bed	*Es hora de irnos á la cama*
It is time to go to bed	*Es hora de acostarnos*
To-morrow night I am going to take my wife to the theatre	*Mañana en la noche voy al teatro con mi señora*
Until to-morrow evening	*Hásta mañana en la noche*

PENMANSHIP

WRITING is the art of expressing ideas by visible signs or characters inscribed on some material. It is either ideographic or phonetic. Ideographic writing may be either pictorial, representing objects by imitating their forms, or symbolic, by imitating their nature or proportions. Phonetic writing may be syllabic or alphabetic; in the former each character represents a syllable; in the latter, a single letter. Of the origin of this art nothing is positively known. The Egyptians ascribed it to Thoth; the Greeks, to Mercury or Cadmus; and the Scandinavians, to Odin.

The first step toward writing was probably the rude pictorial representation of objects, without any indication of the accessories of time or place; the next, the application of a symbolic signification to some of the figures, so that the picture of two legs, for example, represented not only two legs, but also the act of walking. Pictures, abbreviated for convenience, gradually became conventional signs, and in time these characters were made to stand for the sound of spoken language.

The various systems of writing of the ancient world had probably at least three different sources—the Egyptian, the Assyrian, and the Chinese systems—all of which were originally hieroglyphic. The Egyptians practiced four distinct styles of writing—the hieroglyphic, hieratic, demotic or enchorial, and Coptic. Hieroglyphic writing, which was in use much earlier than 3000 B.C., was probably at first ideographic; its symbols became gradually used to represent abstract ideas, and in time acquired a phonetic value. The phonetic characters are both syllabic and alphabetic. In the latter, pictorial figures are used to express the initial letters of the words which they represent; for example, the figure of an eagle, *akhom,* stands for *a,* of an owl, *mulag,* for *m,* etc.

The hieratic writing, which probably came into use 2000 B.C., was a simplified form of the hieroglyphic style, in which the pictorial symbols developed through a stage of linear hieroglyph into a kind of curious hand. The demotic or enchorial writing represents a still simpler form

of the hieroglyphic, and a nearer approach to the alphabetic system. It was in use from about the seventh century B.C. till the second century A.D., when it was gradually superseded by the Coptic, which grew out of the hieratic and demotic under Greek influences.

The Ethiopians also used hieroglyphs similar to those of the Egyptians, and their current written language resembled the Egyptian demotic, but its alphabet had fewer symbols. At a later period a third graphic system, somewhat analogous to the Coptic, came into use, which may be called Ethiopic Greek. With what people the Assyrian Cuneiform or Sphenographic styles of writing originated is not known, but it was originally without doubt a hieroglyphic system, and became gradually modified by the different nations which occupied the Assyrian empire, until it assumed the form of the present known inscriptions.

There are three classes of Cuneiform characters—the Assyrian or Babylonian, the Scythian or Median, and the Persian. The first is the most complicated, containing from 600 to 700 symbols; the second is less complicated, but contains about 100 symbols, or three times as many as the third, which is almost purely alphabetic. Of these three original systems, the Egyptian is by far the most important, for from its hieratic symbols was probably derived the Phœnician alphabet, the parent of almost all the principal graphic systems of the world.

The Roman letters were used in Italy until the latter part of the sixth century, when the Lombardic style was introduced. This is also sometimes called Roman, because used by the Popes in their bulls; it continued in use until the thirteenth century.

The Visigothic style, carried into Spain by the Visigoths, was legally abolished in 1091, and Latin letters were adopted for all public instruments. In France, the Merovingian style prevailed from the close of the sixth century to the end of the eighth. Charlemagne introduced the Caroline, which, having degenerated before the close of the tenth century, was restored by Hugh Capet, and was subsequently called the Capetian. It was in use in England, France, and Germany till the middle of the twelfth century, when the modern Gothic spread all over Europe. The present German alphabet is a modification of this.

There are no traces of writing in Britain before the Roman conquest, when Latin letters were introduced. What is called the Roman-Saxon, resembling the Roman, prevailed until the middle of the eighth century; the set Saxon succeeded it, lasting until the middle of the ninth; this was followed by the running-hand Saxon of the time of Alfred; the mixed Saxon, combining the Roman, Lombardic, and Saxon letters; and the elegant Saxon, which was introduced in the tenth century, and did not become obsolete until the middle of the twelfth. The Norman style, quaint, illegible, affected, and composed of letters nearly Lombardic, came in with William the Conqueror.

The modern Gothic dates in England from the twelfth century; the old English, from the middle of the fourteenth. The English court had a barbarous corruption of the Norman, which was contrived by the lawyers of the sixteenth century, and lasted till the reign of George II, when it was abolished by law.

The utmost diversity exists among different nations in the manner or direction of writing; but in general the Semitic races write from right to left, and the Aryan from left to right.

In form ancient manuscripts were either rolls, *volumnia*, or flat pages like our printed books, *codices*. The Egyptian papyri are usually in rolls of an indefinite length, according to the subject matter, but some of the smaller ones are flat.

The transcripts of manuscripts were committed by the Greeks and Romans principally to slaves, who were esteemed of great value when they excelled in the art. There were also at Rome professional copyists, some of whom were women. About the fifth century, associations of scribes, who worked under stringent rules, were formed. In the middle ages copying was almost exclusively in the hands of ecclesiastics, who were called clerks, *clerici*. In the Imperial Library at Vienna is a Roman calendar executed in the first half of the fourth century. In the Vatican there is a fragment of a Virgil of the fourth century. The most ancient manuscripts extant are the papyrus rolls from the tombs of Egypt, where the dryness of the climate and of the sand beneath which they were buried preserved them in an almost perfect condition for thousands of years.

HOW TO LEARN TO WRITE

BEGIN with good paper, good pens, good ink.

In a good copy the letters should be of elegant form, and constructed on natural principles. Every letter should be as perfect as it is possible for human skill to execute, that wherever it occurs it may present an unvarying model to the pupil. The turns and slopes should be alike, the loops of the same length and width, the proper distances between the letters carefully observed, and shade duly distributed.

"Curlicues," flourishes, and ornamental capitals may delight an amateur in a showcase; a thorough business man detests them in his correspondence. In a lady's writing they are simply vulgar.

The course of instruction given in the copies should constitute a system, arranged in that order of progression which is indicated by a careful analysis of the forms of the letters and of the powers of the human hand, so that each advance may prepare the way for the next, and the steps not be further apart than the necessities of the case compel. To this end, the simpler forms should precede the more complex; the short, the long. Those that have similar curves and turns and identical parts should be together. Words should precede sentences. The columns should be first narrow, then broader, to accustom the hand by degrees to move easily on the given rests across the longest word. These columnar sections, intended to be written down, are the gradual preparation for the sentences, which occupy the width of the page. The selection of the words for the columns should be in accordance with the same principle of progressiveness—first the easier, then the more difficult combinations. In them the loops should so occur that when the copy is written they may be handsomely distributed, and the general appearance of the page be harmonious.

A good paper costs more, but it is indis-

pensable. It should be tolerably thick, well laid, with a smooth surface, moderately glazed; so that the ink will not show through when dry, that there may be no roughness or little hairs for the pen to pick up, and that the pen may glide along without jar on the muscles or nerves of the fingers and hand—a very important consideration now that steel pens are used, as paralysis has, in several instances, resulted from their use, and their injurious effect must needs be greater on a rough surface. A white paper is generally to be preferred to a blue, and, indeed, is almost invariably used.

The pen should be fine-pointed, so that a good hair-line can be made, and have a good springy nib, that the shades may be cleanly cut, and that the writing may not be rendered stiff, a result inevitably following the use of a "hard" pen. They should be of a uniform character as much as possible—not one very hard and another very soft. Slight differences can not be avoided; those that vary least are the best, if they are right in other respects.

A new pen is often greasy, owing to a certain process in the manufacture, and will not retain the ink. Hold a lighted match under the pen—not too close—melt the grease, and remove with a cloth gently applied.

Good ink is a very difficult thing to procure. It should be sufficiently fluid to flow easily from the pen, dark enough to enable the pupil to see at the time what he is writing, and to judge of hair-strokes and shades. It must not evaporate rapidly from the inkstand, nor leave a layer of mud in it; neither should it mould. Frost should not affect it. Ink should stain the paper in order to be permanent. Its color when thoroughly dry should be a deep black, which neither time nor exposure to the sun can change.

Pupils will learn by experiment that, if they raise the pen from the ink suddenly, it will be too full, and apt to blot; if very slowly, the attraction of the fluid will leave none in the pen; and, therefore, a moderate motion must be used. One experiment is worth hours of talking. Attention to this will save many a blot. Cleanliness is as absolutely necessary for the well-being of the pen as for our own.

Pens should be carefully cleaned at the close of the exercise. Always dip and wipe a new pen two or three times before it is written with, or it will be very likely to make a blot. To avoid the same mishap, the pen should never be wiped on the outside of the pen-wiper, but always between the leaves of it. Should the pen-wiper then happen to get on the book, no damage will be done.

A stiff blotter will last the longest, but common blotting-paper, or a piece of newspaper, or any paper, will answer, not indeed for blotting, but for the use we now designate. The copy-book must be kept perfectly clean, and the blotter is to be used for that purpose. The right hand does not soil the book, for it rests on the nails of two fingers and only touches the page with them. It is the left hand that does the mischief. To obviate it, place the blotter so as to cover each column as soon as it is dry after being written, and rest the left hand on that, and not on the page.

POSITION, RESTS, MOVEMENTS

The immediate human instrument in writing is the arm. It consists of three parts, the upper-arm, the forearm, and the hand. The two connections of these are the elbow and wrist. The arm is attached to the body by the shoulder-joint. The position of the body must, therefore, evidently depend upon the use we wish to make of the arm and hand. This use, then, must be determined first. Various ones have been advocated by different teachers. The three following are the most strongly distinguished; the others arise from combinations of two or more of them. First, considering the shoulder as a point of suspension, and moving the whole arm without any support and without any motion of the finger-joints. There are, however, very few who possess sufficient muscular strength and steadiness of nerve to write thus. It is the true movement for striking large capitals and flourishing. Secondly, resting the forearm near the elbow and on the nails of the third and fourth fingers, and forming the letters by its movement without any help from the pen-fingers. Thirdly, resting the forearm and hand as in the last, while the letters are formed by the movement of those fingers only which hold the pen. This generally leads to a feeble, constrained style.

There Must Be Freedom of Style.—This condition can only be fulfilled by keeping the arm free from all unnatural constraint. This precludes it from affording any support to the body. Again, the letters are to be written across the page on a horizontal line. A requirement of beauty

is that this line should be straight. This is secured without much difficulty where the base is ruled. The only important thing is to keep on it. If, now, we take pen in hand, use the elbow, placed opposite the middle of the page, for a pivot, and move the hand across, we find that the arc of a circle is described, touching the base line in only two points. In the middle it rises a full half inch above the base line. This is a difficulty to be overcome. Once more, while mere form does not demand consideration here, because readiness in shaping letters can only be acquired by practice, yet uniformity of slope and similarity of turns, which are required, will evidently greatly depend upon the maintenance of the same relative position of the pen, hand, and forearm for each letter. If we now observe a little further the movement above described, we find that in it the position of the hand in relation to each succeeding letter is changed, and assumes a new direction. How can this difficulty be overcome? Again, it is clear that we shall be able to write much faster, if the pen touches the paper lightly, than if it presses on it heavily: this also contributes greatly to freedom of style. Finally, in order to boldness of style, powerful muscles must, if possible, be brought into play in aid of the slight muscles of the fingers, while forming the letters. This would also help to prevent fatigue. To sum up, the essentials of the work to be done are: long continuance, freedom, forming the letters on a horizontal straight line across the page, uniformity of slope and similarity of turns, rapidity, and boldness. The conditions we have found to be hereby imposed on the arm are: avoidance of unnatural constraint, relief of all unnecessary pressure, movement of the hand and forearm across the page with the same relative position to each letter, and counteraction of the curve arising from this movement, adequate support, and use of powerful muscles.

The Human Instrument.—A little in front of the elbow, at the thickest part of the forearm, we find a mass of muscle. If the arm is placed on the desk, suspended from the shoulder, and resting lightly on this mass as a support, we find an excellent ability for moving the forearm on it with freedom from left to right and back again, within a certain limited distance, the muscle rolling under the arm. We will name this support the *rolling rest.* It is of the highest importance to observe the peculiar movement of the forearm on this rest. It is not to be so used as that, when the hand passes to the left, the elbow moves to the right, and *vice versâ.* The forearm moves sidewise as the muscle rolls under it, with sufficient play, when it is placed at right angles to the base line and opposite the middle of a word or short clause, to carry the hand across from one end of it to the other without changing its direction. Bending the wrist sidewise to the right—a most cramping movement, and painful if frequently repeated—is thus rendered quite unnecessary, and should be carefully guarded against.

By turning the third and fourth fingers under, so that the hand can rest on the corner of their nails, or, if preferred, on the little finger only, another support, like the runners of a sleigh, is provided, capable of moving freely over the paper. We name this the *sliding rest.* To avoid friction, the wrist should not touch the desk; by means of the two rests, it may easily and comfortably be kept a little raised.

These, then, we conceive to be the natural positions and rests—namely, the right hand and forearm in the same straight line, at right angles to the line of writing, and opposite the middle of a long word or a clause of moderate length. The forearm is supported on the rolling rest, the hand on the sliding rest, and the wrist slightly raised.

The left forearm and hand are placed at right angles to the right forearm, with the fingers on the blotter, which covers the part already written, to steady the book, and move it when necessary. The left forearm is therefore in the direction of the line of writing.

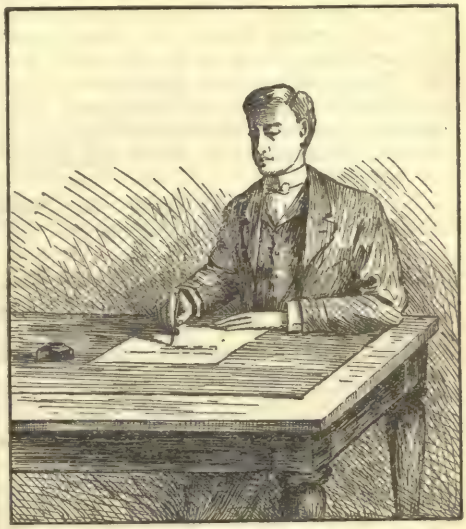
What now are the movements of the right forearm and hand? On the rolling rest the whole forearm moves, so as always to be parallel to its first position, and carries with it the hand supported on the sliding rest. The rolling rest is stationary; the sliding rest glides along the paper on a horizontal line—that is, parallel to the line of writing: this is its only movement. The whole forearm and hand move gradually to the right in this way, with a nearly continuous motion, for the formation of the successive letters, so that their relative position to every letter is the same. All stoppages of the nails and jerks to get the hand forward are to be absolutely forbidden. This movement of the hand is named the *sliding movement;* the movement of the forearm we have named the *comital movement* (Lat. *comes,* a companion), because it *accompanies* the hand.

Since the comital movement is more or less limited, some further means must be found of keeping the forearm and hand in the right relative position to the letters. Two methods offer themselves to us for selection. One is, to draw the paper to the left as we write. The other, which we prefer, is, by means of a lift from the shoulder, to place the forearm and hand in a position further to the right: this should be done only at the end of a word. To distinguish this movement, we have named it the *lateral movement.* In performing it, the hand slides as before. Experiment will now demonstrate that, by the adoption of the rolling rest and the lateral movement, the difficulty mentioned above, of the curve formed by the hand crossing the page, is entirely done away with.

For the Attaining of Boldness of Style, the powerful muscles of the forearm must be brought into action by a slight play of the whole forearm forward and backward, in direction of the slope on the rolling rest, over the sliding rest—a fixed point, so far as this movement is concerned. This gives a full heft, through the medium of the hand, to the fingers which move the pen, and, as a consequence, boldness of style; just as a large and massive stone rolling down a hill maintains its course over considerable inequalities of surface, while the slightest obstacle diverts a small and light one. This play of the forearm we name the *muscular movement.* The resulting play of the hand, as the *medium* of its transmission to the pen-fingers, we name the *medial movement.*

We are now prepared to form a correct judgment as to the best position of the body for the accomplishing of these movements most naturally, and consequently with the least fatigue. It may be summed up in two words. The body must be upright and self-supported. Its relative position to the desk is a matter of comparative indifference; only, all the pupils should conform to one plan. Each position has its advantages and inconveniences. The simplest division of positions is twofold; the right side to the desk, and the face to the desk.

Where we adopt the former, we direct the pupil to turn on his seat, so that his right side may be directly to the desk without touching; the body to be erect, and supported by the spinal column; the left foot slightly advanced. The book is adjusted with the back to the front edge of the desk, and at a two-seated desk, the top edge of one at the outside edge of the desk, of the other in a line with the inkstand. When opened, the left side of the page to be written on is to be placed at the edge of the desk. The left hand is brought across, and the fingers placed on the left side of the page to keep it steady. The right forearm is placed on the desk, parallel with the front edge. If necessary, from short-sightedness or bad adaptation of the height of the seats to the desks, the body may be inclined forward from the seat—never by rounding the back and contracting the chest—and the head may be bowed somewhat forward by bending the neck. The advantages of this plan of seating the scholars are: the perfectly natural position of the



body; the freedom of the right arm from all avoidable weight, and its ability to form the movements required; the certainty that both rests are on the desk; and the facility with which the teacher can look down the files and along the lines in large classes, and see that every pen is rightly held, and every movement correctly made. An objection to this position is made on the ground that, in business, when using large account-books, it is impossible. We reply, that we adopt this position for learners, because it is very convenient for the teacher. When the art is acquired, the position becomes a matter of comparative indifference.

Where we adopt the second method of seating, namely, the body fronting the desk fairly, or with more or less inclination of the right or left side to it, we take care of these two points: that both rests of the

right forearm shall be on and be kept on the desk, and that the book is at right angles to the right forearm. The following troubles are apt to arise: A tendency to sprawl over the desk, and, as a necessary consequence, to press the chest against it —a practice most injurious. The book gets turned from its proper position at right angles to the right forearm. When writing down a column, a habit we strongly commend for learners, the book must be continually pushed up, or the back rest of the arm will get more and more off the desk. Indeed, pupils are sometimes found actually resting the wrist on the front edge of the desk. On the other hand, this is often the only position the seats admit of; it is the position that must be adopted when writing large account-books; and there is no necessity that the above faults should prevail. They certainly will not under the care of a faithful teacher. We conclude, then, that the position of the body at the desk is matter of indifference, provided it is upright and self-supported.

The next point which claims our attention is the manner of holding the pen, and the movement of the pen-fingers. We have seen that the hand is supported on the sides of the nails of the third and fourth fingers. Their ends, being bent under, are separated from the others, and there is room for the execution of the pen-finger movements. The fingers should touch one another at the second joints, as far as the shape of the hand permits: this gives unity and support.

The pen is held by means of the thumb and the first and second fingers. Place the right extremity of the holder against the left side of the second finger just below the nail; the end of the finger will thus be above the pen. Next, adjust the holder obliquely across the left side of the third portion of the first finger, just behind the second joint, the middle finger being at the same time slightly bent. The first two portions of the forefinger may now be closed down on the holder, which will be found to cross and touch them diagonally. The first and second fingers touch throughout. Next, let the upper corner of the fleshy part of the thumb, near the nail, be placed, by slightly bending the thumb, against the lower half of the left side of the holder, opposite the first joint of the middle finger, and the pen will be found in a secure and natural position, both for extension and retraction. It will be observed that we have given the medium position of the pen. The fingers and thumb with the joints slightly bent outward, straightening them would extend the pen; bending them still more would retract it. The pen is really held between three points—the side of the end of the second finger, the side of the third portion of the first finger behind the second joint in front of the knuckle, and the side of the end of the thumb. The first finger is like the lid of a box placed on it to keep the pen from jumping out; it is also the principal agent in effecting the pressure for the shades. As to movement, the thumb may be regarded as a spring. The first and second fingers, by contraction of their muscles, press against it; we relax its muscles, and it yields by bending: thus the downward strokes are made. By relaxing, in turn, the muscles of the fingers, and straightening the thumb by calling its muscles into action, it pushes back the fingers, and the up-strokes are formed. The movement is twofold and alternate, extending and retracting, to form oblique lines, ovals, or horizontals.

The pen must be held with the least possible grasp. It is to be at right angles to the base line, and thus in a line with the forearm. Great care must be taken to guard against a wrong position of the hand and pen. The pen must be so held that the right side is turned a little down, so that the right nib touches the paper first when the pen is put down. With this right nib the hair-strokes are made. The nibs, so to speak, are at right angles to the slope; not horizontal. By this means the shades can be made smooth. When it is neglected, the shades will be "scratchy," or rough on one side. A glance at the holder tells the teacher in a moment if the hand is right. With beginners, it will be found almost as variable as a weathercock. Now it is inclined to the right, showing that the hand is lying down—a fault requiring constant watchfulness, and arising from neglect of the comital movement of the forearm; now to the left, showing that the hand is turned too far over in that direction. Now the end points outward, showing the elbow has got away; again, it points inward, showing that the wrist is bent to the right.

The forearms rest lightly on the desk at right angles to one another. The right is supported by the rolling rest, and the hand by the sliding rest. The left arm has the fingers on the left side of the book, to steady it and to move it when necessary. The copy-book is placed with its vertical lines in the direction of the right forearm, and its horizontal lines in that of the left.

It must be kept far enough on the desk to allow the rests also to be on. This position of the book at right angles to the right forearm is invariable, whatever direction the arm may be in on the desk.

The rolling rest is the muscle in front of the elbow; the sliding rest, the corners of the nails of the third and fourth fingers bent under.

THE MOVEMENTS OF THE FOREARM ARE THREE. The comital, which accompanies the sliding movement of the hand, and is made sidewise on the rolling rest. The muscular, which causes the medial movement of the hand, and gives heft to the pen-fingers. It is a play of the arm forward and backward on the rolling rest. The consequent medial movement of the hand is made over the sliding rest, of which the only movement is in a horizontal line. The lateral is the lifting and moving the whole forearm and hand to the right: it is rendered necessary by the limited scope of the comital.

The simplest movement for beginners is to form the letters by the motion of the fingers, moving the hand and arm along by the united sliding and comital movements, which should be nearly continuous. When thoroughly familiar with these, after considerable practice, the medial and muscular movements may be added to give freedom and boldness of style. The lateral will not be needed until sentences are written.

The movements of the pen-fingers are in different directions, by extension and retraction: thus are written oblique straight lines; ovals, direct, inverted, and alternate; and horizontal lines. The shades are made by pressure. As to these, great care is needed. They must be made in ovals, with a gradual increase and diminution of pressure. The usual fault is to make them too abrupt, or with the greatest thickness too long continued. The moment the thickest point is reached, the pressure should begin to diminish. Special directions are given in the analysis of the letters, where needed.

ELEMENTS AND PRINCIPLES

Words are represented in writing by a single letter, or by a combination of letters. Letters are complex; they can be resolved into forms common to several of them: thus, the form repeated in *u* is found also in *i* and *w;* or, they are expressed by one such form as *j*, found in *g* and *y*. In some there are parts not found in any other.

In writing, the letters are placed on horizontal lines, either ruled or imaginary. Some of the letters and parts of others are longer than the rest. The letter *o*, which is the pure oval, is taken as the standard of size. We name the line on which the writing rests the Base Line. Suppose a line parallel to this to be drawn so as to touch the top of the *o*. This, whether ruled or imaginary, is named the Head Line. The distance between the base and head lines is called one space, and gives the height of the first four principles, wherever they enter into the formation of letters. The dot of the *r*, the point of the *s*, the top of the second part of the *k*, are one-third of a space higher.

Suppose, now, six lines parallel to the base line to be drawn, three above the head line, and three below the base line, at intervals equal to the first space. We shall have eight parallel lines bounding seven equal spaces in a vertical direction. We call the middle space the first; the next above and below, the second; the next, the third; and the last, the fourth. One of these spaces is taken for the unit of measurement.

RULE.—Loop letters are four spaces, and double loops seven; *t* and *d* two and a half, *q* three and a half, *p* five, two above and two below the first space. All the rest are one space, except *r*, *s*, and the second part of *k*, which are one and a third.

The capitals are four spaces.

It will be observed that *f*, long *s*, and *p* extend as far above the first space as they do below; and that the top of *p* is a little higher than that of *t* and *d*, and the bottom of *q* a little lower than that of *p*.

The commencing and ending lines of the letters are always to begin and terminate at the base and head lines respectively.

THE TWO DIVISIONS OF LETTERS

There are two grammatical divisions of letters, distinguished by their forms: the small letters, which form the main body of writing, and the capitals, which are used on special occasions. We shall begin with the analysis of the capital letters. We shall not, however, take them up in their alphabetical order, but in that which gives the easiest first, and shows their similarity, arising from the possession of common principles. This is the method adopted in our copy-books, in order to render our system of teaching gradually progressive.

THE CAPITAL LETTERS

General Rules

The height of the capitals is four spaces, the same as the loop letters.

A. This letter has three parts. The first part is generally written upward, the upper curve very slight. The second part is very slightly curved to one-third from the top, then it is a straight line, of which the shade gradually increases. The third part is the cross. It starts from the right foot, coincides for a half space, crosses to the left and forms a loop, the centre of which is one-third the height of the letter, and on the double curve line. A line from the top through the centre of the letter would be on the main slope; hence it will be seen that the second part, or down-stroke, has a little less than the main slope, the first part a little more. Observe that the width of the letter gradually increases from the top to the base, and regulate the first upstroke accordingly.

N. This letter consists of three parts. The first two are the same as in *A*, except in slope; at the bottom of the second a very narrow turn is made, and a curve carried up from it, parallel to the first upstroke, four-fifths the height of the letter. The spaces on a horizontal line across the middle are equal. The shade begins as in *A*, and is heaviest just before the turn. A line drawn through the centre of the letter, dividing it into two equal lateral halves, would be on the main slope. Observe the gradual increase and diminution of width in the two sections. See the cautions on *A*.

M. This letter has four parts. The first three are the same as *N*, except that the third stroke is carried to the full height. The fourth part is curved from the top, and closes with the direct oval. Observe the shades carefully. A line through the centre, dividing the letter into equal lateral halves, would be on the main slope. The widths at the top and the two at the base are equal. On a horizontal line through the middle there are three equal spaces.

T has two parts. The strongest curve is in the lower section. There is no shade except in the third principle and dot.

F is *T* crossed in the middle by a small double curve placed horizontally, which is itself crossed by a small straight line on the main slope.

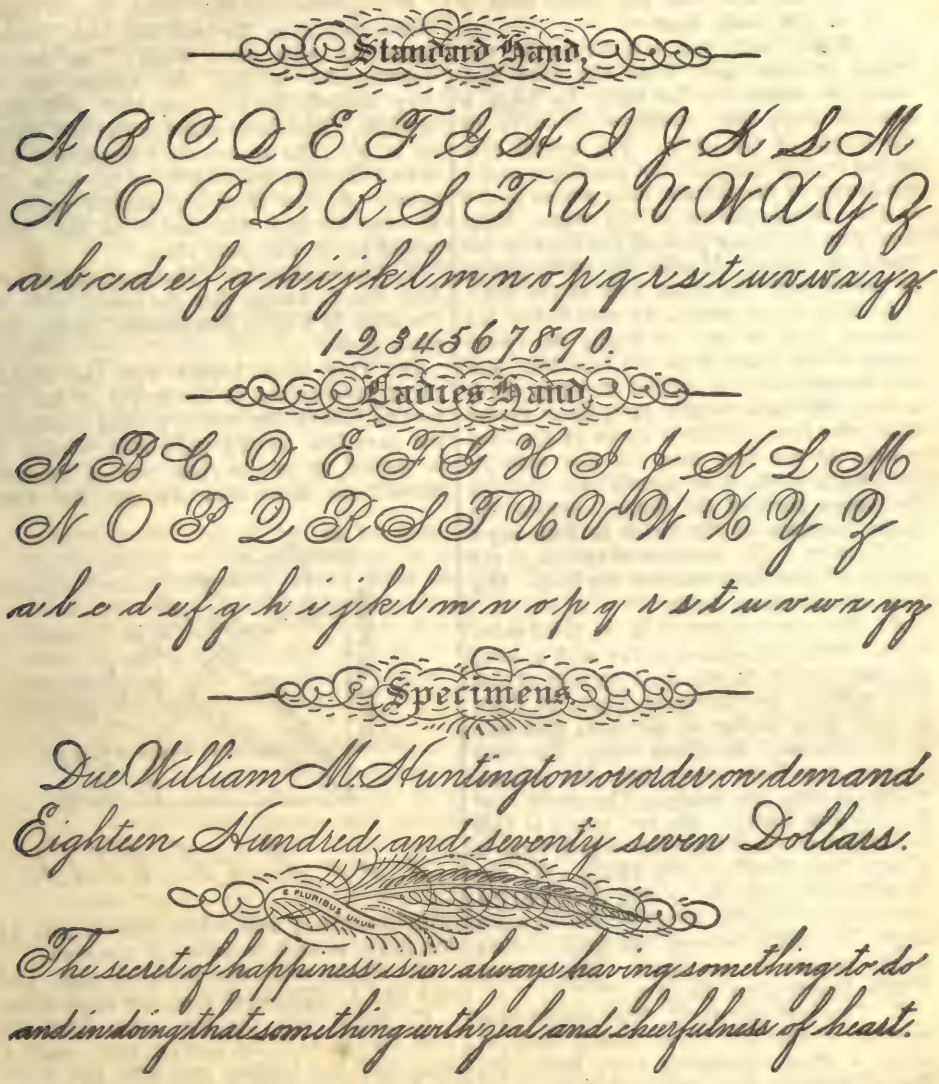
P. This letter has two parts, the stem and the cap. It is on the main slope. The cap begins with the inverted oval, two-thirds the height, on the main slope, crossing the stem at right angles, the highest point of the cap being in the middle of the line between the section of the oval and the stem; it is continued with the right curve, and terminates on the stem in a dot at half the height of the letter. On the short diameter of the first oval produced to the stem, there are four equal spaces; on a parallel line from the left curve of the oval crossing the stem to the other curve, two equal spaces. A line on the main slope through the oval would pass through the dot.

B. The stem and cap are like *P*, only that the right side is carried down one-third instead of a half, and the dot is omitted. The separation between the upper and lower sections of the right side is made by a horizontal loop. The lower curve ends with the inverted oval. A straight line drawn on the main slope, touching the right side of the upper curve, would pass through the centre of the lower oval; the lower right curve, therefore, projects beyond the upper. Across the first oval to stem on its short diameter produced, there are four equal spaces similarly as to the last oval, three. On a parallel line from the right side of the first oval to the right side of the upper lobe, there are two equal spaces.

R is like *B* as far as the separating loop, which is here made at right angles to the main slope. After that the descending curve is turned back to finish with the direct oval. Across each of the two ovals to the stem on their short diameters produced, there are four equal spaces. On a parallel line from the right side of the first oval to the right side of the upper lobe there are two equal spaces. A line on the main slope through the oval would pass through the dot.

X. The capital-stem is made first, writing downward. Then the inverted oval and direct oval joined by a straight line on the main slope. The two parts of the letter coincide through half the height, commencing at one-fourth from the top. Across the ovals there are four equal spaces. The remark on the dot applies also.

S. Begin from base line with the right curve on the slope of the connecting lines to half the height of the letter, then form a loop on the main slope, half the height, complete a double curve, and end with a dot on the commencing line. The dot is half a space high, and on the main slope. The double curve is the essential part of



this letter. Notice how the loop is formed on the upper part, and the greater intensity of curve is on the lower part. Let the shade begin just below the loop, and be nicely graduated. Give much attention to the lower turn and the dot. An oblique line through the loop lengthwise has similar curves formed on the double curve, on the upper left and lower right side.

L. This letter begins like *S*, but the double curve, instead of making a turn to end with the dot, is carried to the left to form a horizontal loop, which rests on the base line, and whose thickness is half a space; it descends on the right side to touch the base line at precisely the same distance from the crossing as on the left side, and ends with the direct oval incomplete. The lower curve of the stem is stronger than the upper. It will be observed that the upper curve of the horizontal loop, and the curve to the right which touches the base line, together form a double curve. The right section only of the direct oval is used. The shade begins as in the *S*, below the loop. The bottom of this letter, which may be termed the *L*-foot, occurs also in *D*, *Q*, and one form

of *Z*. Take care that the direct oval is made on the main slope.

I. Begin with the left curve at the height of one space from the base line, carry it round to the right to form a circular loop, and continue to curve to the height of the letter. The second part of the capital-stem and dot passing through the centre of the circular loop, whose centre is also in the middle of the stem. Take care that the upper part of the head is not made too broad. Modify the curve gently to accord with the upper part of the stem.

J. This letter begins as the *I*, but the circular loop is not so high; its lower curve is one space from the base line, and the double curve is carried down to form a loop, the same length as *j*, three spaces below the line. The left curve of the loop crosses at the base line. A line through the length of the loop should pass through the upper part of the letter. Notice the slight intensity of the curve in both parts of the stem. The heaviest shade is in the middle of the right side of the loop. The loop is one space wide.

H. The commencement is the third principle. Next, the double curve with a loop, the hair-stroke of which is carried across and upward, on the same slope, to form another loop similar to the first; this side is finished with the direct oval. The first section is a little lower than the second, which is the full height. The middle of the hair-line between the two stems is half the height of the letter; hence each loop is a little less than half the height. An oblique line through the centre, dividing the central space equally, would be on the main slope. The width between the down-strokes at the middle is one space. The second loop is longer than the first.

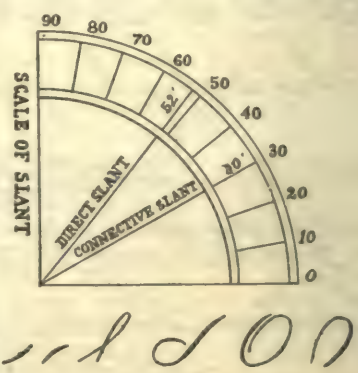
K. The first part is *T*. The second part consists of the left curve turned back to make a small separating loop, then continued symmetrically with the upper part, and closed with the direct oval. The separate curve is inclined as in *R*, and is one-third the height of the letter from the top. The slope is the same as in *H*.

V. Commencement. Next, down-stroke straight, shaded heaviest near the turn, which is narrow, like those of the small letters. Then, up-stroke parallel to previous one, branching off into the left curve, and terminated at the same height as the top of the introductory part. An oblique line through the centre, dividing the letter into two equal parts, would be on the main slope.

W. Commencement. Next, double curve down, ending on the base line; then, double curve up with more slope. The second down-stroke is like the second of *A*, very slightly curved one-third, and then straight. The final stroke is the left curve, as in *N*. The spaces on a horizontal line drawn through the middle of the letter are equal. A line from the middle point at the top through the centre of the letter would be on the main slope.

Z. Commencement. The down-stroke and foot like *L*, except that the lower curve of the stem is a little less intense. It has the main slope.

D. This letter begins with the double curve, commenced at the height of the letter; its foot is like that of *L* until it touches the base line on the right side, whence it is carried up as the right side of an oval, crosses the stem near its top, and ends



with the direct oval. The highest part of the letter is well in front of the stem.

Q. Begin with the inverted oval, and end like *L*. The oval is on the main slope.

C. Begin with the left curve from the base line to half the height: next, make a loop half the height; end with the direct oval. Take care that the loop does not pitch over too much. It necessarily has more than the main slope.

E. Begin with the left curve a little distance from the base line, carry it two-thirds high, and make a loop one-third; continue the curve to form a small separating, nearly horizontal, loop to the right, and close with the direct oval. The separating loop is a little inclined down to the right, to correspond to the lower oval.

G. Begin with the left curve; then, a loop two-thirds the height of the letter; continue the down-stroke as the bottom of an oval, whose width is twice that of the

loop, the bottom of the turn being one-fourth from the base line. End with a double curve and dot: the double curve is half the height of the letter. Both parts of the letter are on the main slope. A line through the length of the loop would pass through the dot.

Y. This letter begins with the inverted oval, continues like third principle to one-fourth from the base line, but the lower turn much narrower than the upper, and ends with the double curve and dot; height, two-thirds.

U. Begin with the inverted oval; continue as *Y*, except that it rests on the base line. The second part is a straight line ending with a direct oval. The top of the second part lower than that of the first. Its width is two spaces.

CLASSIFICATION OF LETTERS

Classification relates to the arrangement of the letters in groups, according to their possession of common forms. Since every letter must have something peculiar to distinguish it from others which have a common principle, classification includes a description of this peculiarity, which is termed the characteristic.

CLASSES OF SMALL LETTERS

The most natural and convenient division of the small letters seems to give four classes. Some letters will be found to belong to two of them. The reason of the position here assigned is obvious.

First Class.—Those letters which consist chiefly of the first, second, and third principles, *i, u, n, m, v, w, x*.

Second Class.—Those formed from the oval, or the fourth principle, *o, a, c, e*.

These two classes contain all the short letters except two.

Third Class.—Those which have stems formed of the first element, *p, q, t, d*. These are called the Stem Letters.

Fourth Class.—Those which have the fifth and sixth principles, *h, k, l, b, j, g, y, z, f*, long *s*. These are the Loop Letters.

Besides these, there are two letters whose forms are anomalous, *r, s*.

CHARACTERISTICS

The characteristics of the letters are as follows:

In the First Class. Of *i*, *one* straight line with *turn* at the bottom and the dot above it;—of *u*, *two* straight lines with *turns* at the *bottom*;—of *n*, *two* straight lines with *turns* at the *top*;—of *m*, *three* straight lines with *turns* at the *top*;—of *v*, its *two* nearly parallel sides and the dot;—of *w*, its alternately parallel sides and the dot; of *x*, the straight line forming the cross.

In the Second Class. Of *o*, the oval;—of *a*, the addition of the first principle;—of *c*, the dot;—of *e*, the loop.

In the Third Class. Of *p*, the third principle affixed;—of *q*, the fourth principle prefixed;—of *t*, the cross;—of *d*, the fourth principle prefixed to the *t*-stem without the cross.

In the Fourth Class. Of *h*, the third principle affixed;—of *k*, the knot or kink;—of *l*, the turn at the bottom;—of *b*, the parallel sides of the lower part and the dot;—of *j*, the dot;—of *g*, the fourth principle prefixed;—of *y*, the third principle prefixed;—of *z*, the second principle and shoulder; in the other form, the zigzag;—of *f*, the knot.

In the anomalous letters. Of *r*, the dot and shoulder;—of *s*, the twist on the right side.

OF CAPITALS

We give the Capitals in the order of their introduction. *O,—A, N, M,—P, F,—P, B, R, X,—S, L,—I, J,—H, K,—V, W,—Z, D, Q,—C, E,—G, Y, U.*

OCCURRENCE OF PRINCIPLES

The capital-stem, or line of beauty, ending with a dot, occurs in fourteen letters, *A, N, M, T, F, P, B, R, X, S, I, K, G, Y*.

The capital-stem is written:—

Generally upward and light in three letters, *A, N, M*.

Downward and light, in eleven letters, *T, F, P, B, R, X, H, K, W, Z, D*.

Downward, light and short, in two letters, *G, Y*.

Downward and shaded in the lower curve, in three letters, *I, L, S*.

Downward, prolonged into a loop, shaded on the right side, in one letter, *J*.

The third principle of small letters is used for the commencement of seven letters, *T, G, H, K, V, W, Z*.

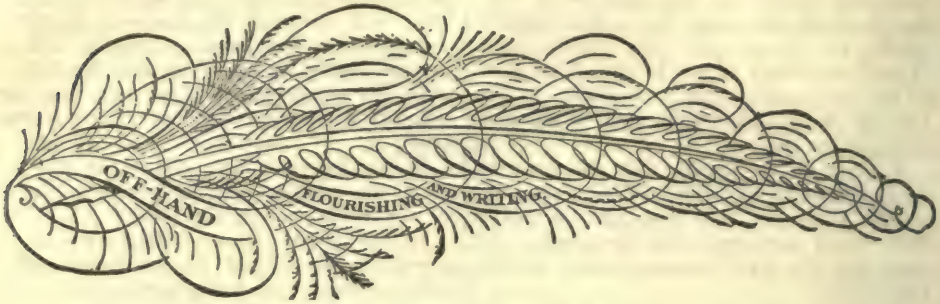
The direct oval, when of full size, forms the *O*.

Four-fifths of the vertical height, it is the end or front of *D*.

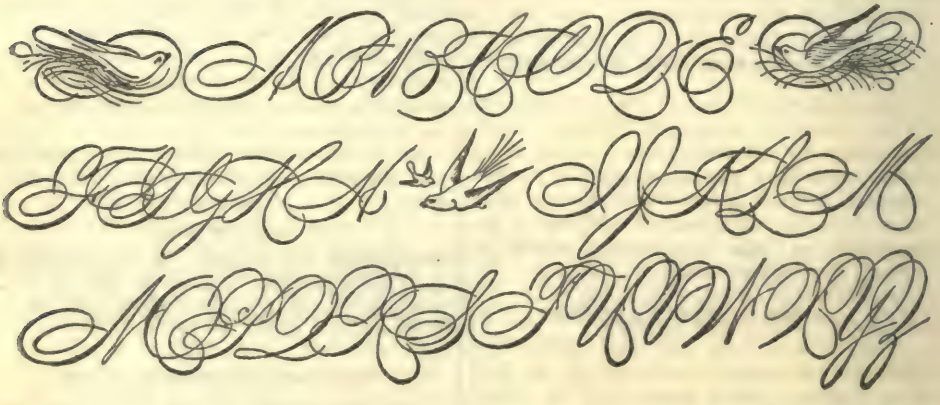
Half the height, it terminates eight letters, *M, R, X, H, K, C, E, U*.

One-third the height, it ends *L, Z, Q*.

The inverted oval, two-thirds the height,



Whole Arm Capitals



Ledger Hand

Merchandise Commission

Medium Hand

Good writing is a passport to success in life.

Corresponding Hand

Everyone should write an easy, rapid and graceful hand.

commences seven letters, *P, B, R, X, Q, U, Y.*

Half the height, it ends one letter, *B.*

A curve and circular loop are used for the head of *I, J.*

The loop, half the height of the letter, is found in six letters, *S, L, J, H, C, G;* one-third the height, in *E.*

The knot, kink, or small separating loop, is found in three letters, *B, R, K;* turned in the opposite direction, in *E.*

The horizontal loop, or *L*-foot, is found in four letters, *L, D, Q, Z.*

The first element, very slightly curved to one-third from the top, is found in *A, N, M, W;* straight throughout, and closed by a turn, in *V.*

COMBINATION

Combination treats of the arrangement of letters in words at proper distances. This is generally spoken of as Spacing. It is effected by the connecting lines of the two letters running into one another, and thus forming one line, which may be distinguished as the Combining Line. Good taste requires that the letters in a word should look about the same distance apart; in other words, that the space on the line which the word occupies should be evenly filled. If this is neglected, the writing will look "patchy"—crowded in one place, scattered in another. We propose, therefore, to give rules for these distances, and to point out the reasons on which they depend.

Every letter ends with a straight line, having a diagonal connecting line with a turn, as *u,* or without a turn, as *j, q;* or is an oval with a horizontal connecting line; or is open on the right side, as *c* and *e.* Every letter begins with a straight line, having a diagonal connecting line without a turn, as *u, h, p,* or with a turn, as *n, y;* or is an oval, as *o, a;* or is open on the left side, as *s,* in which the up-stroke is merely the connecting line. The combinations of these different classes of letters may be determined by the following rules:

Rule 1.—When two straight lines, or a straight line and an oval, are united by one turn and a combining line, or by a combining line only, the distance between them is one space, the height of *o;* as *ii, ni, it, ih, ip; io, ie; gi, go, qu,* etc. Between *is, us,* etc.; the distance is really the same, because the width of *s* equals that of *o;* but since we have to measure to the right side, it is a space and a half.

Remark.—In *it, ih, ip,* where the combining line joins the straight line at one-half, one-third, and the top, respectively, the distance is kept by giving the less slope to the combining line. In *gi, qu,* etc., the same means are used.

Rule 2.—When two straight lines are united by two turns and a combining line, the distance is one space and a half; as *in, ir, nu, my, pn,* etc.

Remark.—This gives room enough to make the turns properly, and the line crossing diagonally prevents the distance from seeming too wide.

Rule 3.—When two ovals, or an oval and a straight line, are united by a combining line only, or by a combining line and turn, the distance is three-quarters of a space; as, *oo, oc, od, ba, ve, wo; oi, ot, oh, op, vi; on, vn,* etc. The last part of *b, v, w* is equivalent to the oval. In *os* the distance is really the same, since *s* is the width of *o;* but as we measure to the right side it is a little more than one space.

Remark.—A full space for the distance mentioned in the first part of this rule would be too much, because, as the connecting line is horizontal, there is nothing to disguise it. We have, therefore, to bring the main lines nearer.

Rule 4.—When *c* or *e* precedes a letter beginning like *u,* or an oval, the distance is one space and a half; as *ci, ei, cl, el, ep; co, eo, ce, ee,* etc.

Remark.—The distance in this case is measured from the left side of the *c* and *e,* and is crossed by the combining line diagonally.

General Remark.—The combining line does not have an invariable slope, but is determined by the necessities arising from the rules of combination.

Rule 5.—Words are written about one space apart. This, however, depends very much on whether we wish to give the writing a free or a condensed appearance.

THE METRIC SYSTEM OF WEIGHTS AND MEASURES

THE metric system of weights and measures is based on the decimal division in accordance with our systems of numeration and coinage. It is in common use in all civilized countries except Russia, England, and the United States, and is legal in these. On account of its simplicity and accuracy it is in use for scientific work throughout the world.

In July, 1790, Thomas Jefferson, then Secretary of State, prepared, at the request of Congress, a report on weights and measures, in which he proposed "to reduce every branch to the decimal ratio already established for coins, and thus bring the calculation of the principal affairs of life within the arithmetic of every man who can multiply and divide." This was approved by President Washington and Congress, but action was deferred because the French Assembly was preparing a similar system, and it was thought very desirable to make it international.

The Metrical System is based upon the length of the fourth part of a terrestrial meridian. The ten-millionth part of this arc was chosen as the unit of measures of length, and called *Mètre.* The cube of the tenth part of the metre was adopted as the unit of capacity, and denominated *Litre.* The weight of a litre of distilled water at its greatest density was called *Kilogramme,* of which the thousandth part, or *Gramme,* was adopted as the unit of weight. The French astronomers seem to have estimated the average length of a degree of latitude at about 69.042 miles, which is something less than the length now estimated at the Equator: 69.16.

When the metric, or decimal, system was invented, it was hoped that it would be adopted as a universal method of calculation. In this, however, expectations have not been realized, except in scientific computations, where a common standard is positively necessary. At the same time it was attempted to substitute a decimal system for measuring time, instead of the duodecimal (twelve) system now in use. But this change was so perplexing to the people that it was finally abandoned.

In 1866, the metric system was made legal in the United States, and in 1875 the International Bureau of Weights and Measures, of which the United States is a member, was established, and took up the task of

preparing the national prototypes of the standard metre and kilogram for distribution among the several nations composing it. In 1893, the metre was made the unit of measurement in the United States, and the yard defined with reference to it. In 1890, the United States Pharmacopeia adopted the system for prescriptions.

ANALYSIS AND COMPARISON OF METRIC UNITS

THE METRE.—Having adopted as a standard the one-ten-millionth part of ninety terrestrial degrees, so as to have a decimal system of calculation, or one in the scale of tens, their unit was estimated as about .000621 mile; 1.09363 yard; 3.86090 foot; and 39.3708 inches. This is the length now known as the "metre," or "meter," and from it all the measures of volume and weight have been derived. The ease and convenience of having a scale of tens in measure greatly facilitates calculation, and enables one to find instantly the comparative values of any given quantity.

DECIMAL UNITS.—Thus a metre is subdivided into ten parts, one hundred parts, and one thousand parts, giving the table, with Latin numeral prefixes, as follows:

10 millimetres make one centimetre,
10 centimetres make one decimetre,
10 decimetres make one metre.

These prefixes are the Latin words, *decem,* ten; *centum,* one hundred; and *mille,* one thousand. Measures larger than a metre are indicated by the Greek numerals: *deka,* ten; *hekaton* (*hecto*), one hundred; *chilioi* (*kilo*), one thousand; and *myria,* ten thousand. Thus we have the table of quantities more than one metre, as follows:

10 metres make one dekametre,
10 dekametres make one hectometre,
10 hectometres make one kilometre,
10 kilometres make one myriametre.

Square, or surface measure, and cubic, or solid measure, are based on the same decimal scale, except that square measure naturally increases on a ratio of hundreds, as measuring two dimensions, and cubic measure, on a scale of thousands, as indicating three dimensions. Thus:

100 square millimetres make one square centimetre,
100 square centimetres make one square decimetre,
100 square decimetres make one square metre, etc.

The cubic measure is as follows:

1,000 cubic millimetres make one cubic centimetre,
1,000 cubic centimetres make one cubic decimetre,
1,000 cubic decimetres make one cubic metre, etc.

THE GRAM, OR MEASURE OF WEIGHT.—Measures of weight and capacity are based on the cubic system. Thus, for weight we have the "gram," or "gramme," which is the weight of a cubic centimetre of distilled or perfectly purified water, weighed at the temperature when it has its maximum, or greatest, density, which is at 4 degrees, centigrade, or 39.2 degrees, Fahrenheit, the latter being the common form of thermometer. Thus, as we would say, the water must be weighed when it is at a temperature of 7.2 degrees above the freezing-point, or "zero."

THE LITRE, OR MEASURE OF CAPACITY.—In the same fashion the unit of capacity is found by taking a box or can of the exact capacity of one cubic decimetre. This is what is called the "litre."

But the gram and the litre are divided and increased on a ratio of tens, instead of on one of thousands. Thus it is that while a cubic centimetre of water in the conditions just mentioned weighs one gram, a cubic decimetre of water would weigh one kilogram, and a cubic metre, one hundred myriagrams. So, also, a cubic metre of any substance would occupy a measure of one kilolitre, or one thousand litres.

THE ADVANTAGES OF THE METRIC SYSTEM

1. SIMPLICITY AND CONVENIENCE IN PRACTICAL USE.—All the weights and measures have the same multiple (ten) and the same prefixes, so that there is really only one table instead of twelve or more. It has the same advantage over the common weights and measures that dollars and cents have over guineas, pounds, shillings, pence, and farthings. In all commercial and mechanical work its adoption would effect an immense saving in time and money. Calculations which in our ordinary units are rather difficult can be performed mentally in the metric system. If any one will solve the following problems he will see the difference:

I*a*. Mercury is 13.5 times as heavy as water. What is the weight of a litre? Answer: 13,500 grams.

I*b*. What is the weight of a quart?

Since there are two different quarts and three systems of weights in common use, there are several answers possible.

Answers: 28 pounds, 2 ounces, 4 drams, 21.798199296 grains avoirdupois; or, 32 pounds, 11 ounces, 2 drams, 6.672 grains avoirdupois; or, 39 pounds, 6 drams, 1 scruple, 13.86 grains apothecary; or, 34 pounds, 2 ounces, 3 drams, 1 scruple, 6.175 grains apothecary; or, 39 pounds, 8 ounces, 16 pennyweights, 9.86 grains Troy; or, 34 pounds, 2 ounces, 8 pennyweights, 14.175 grains Troy.

II*a*. If 154 metres of rope cost $1, how much will one cent buy? Answer: 154cm.

II*b*. If 154 yards of rope cost $1, how much will one cent buy? Answer: 1 yard, 1 foot, 7.44 inches.

2. Ease in Learning.—Very few people remember all the tables of weights and measures in common use, while the metric system can be memorized in a few minutes. About two years of the time a child devotes to arithmetic is spent on compound numbers, and the work in this is often unsatisfactory. Where the metric system is in use only a few weeks are required for a mastery of the subject.

3. The System is International.—The weights and measures used in the United States are not all the same as those used in England, although the names are the same, and even in the United States different States have different values for the same measures. Our consuls report that the United States are losing a great deal of trade through having weights and measures different from the rest of the world.

4. Simple and Exact Relations between weights and measures of length, area, and capacity. To change from one table to another in any other system requires somewhat difficult calculation, often involving the use of very inconvenient factors.

5. Permanent and Exact Standards.—The standard metre is the length between two lines on a platinum-iridium bar in the archives of Paris, and copies very exactly compared with this are in the possession of every government. Its length is also known in terms of the wave length of light, so that it could be exactly reproduced if all copies were destroyed. The standard kilogram is prepared and preserved in the same way. The metre is nearly one forty-millionth of the earth's circumference, and the gram is the weight of one cubic centimetre of water.

OBJECTIONS TO THE METRIC SYSTEM

Two objections have been raised against the metric system. One is that the decimal system is not suitable for weights and measures, because ten is not divisible by three and only once by two. This objection applies equally to almost all of our common weights and measures, to our coinage, and in fact to our whole system of decimal notation. But so long as we count by tens—and there is no probability of changing to a duodecimal or any other base—it is manifestly best to have our weights, measures, and coinage in accord with it. In fact, the use of decimal subdivisions is so rapidly increasing from practical considerations that we shall soon have decimal weights and measures anyway. The surveyor divides the foot into tenths, the mechanician uses hundredths of an inch, and the business man thinks in percentages. The hundredweight is superseding the bushel, and the short ton of 2,000 pounds is driving out the long ton of 2,240 pounds. A system developed spontaneously in this way lacks, however, the other advantages of the metric system.

The practical objection of the difficulty of introducing the metric system when all our land, buildings, tools, machinery, etc., are measured by the old system, and we are used to thinking in the old units, is the real obstacle that has hitherto prevented its adoption. The change was made, however, in Germany and in the other countries in a few years by government authority without public inconvenience. It is not to be expected that the old units will drop out of use and speech at once. We still sometimes hear of shillings and bits, and the chain and fathom and hand are still in use.

The metric system as actually used is much simpler than as it is taught in our schools. All the divisions are named so that a measure of a size suitable for any particular purpose may be chosen, but only a few are in common use, just as we do not often use dimes, eagles, and mills in calculation. If the following simple relations be memorized a person will have

all the metric system he is likely to use in daily life.

10 millimetres make one centimetre.
100 centimetres make one metre.
1000 metres make one kilometre.
1000 milligrams make one gram.
1000 grams make one kilogram.
1000 cubic centimetres make one litre.
One cubic centimetre of water weighs one gram.

During the transition period and for reading foreign news it is convenient to have in mind a few rough equivalents, such as—

A metre is about a yard (39 1-4 inches).
A kilometre is half a mile (.6 mile).
A litre is a quart (.880387 quart).
A kilogram is about 2 pounds (2.2 pounds).
A centimetre is ⅖ of an inch (.3937 inch).
15 grains make a gram.
28 grams make an ounce.

The full tables and the exact conversion factors are given below.

METRIC SYSTEM OF WEIGHTS AND MEASURES

LINEAR MEASURES

1 metre (m) = 10 decimetres (dm) = 100 centimetres (cm) = 1000 millimetres (mm) = .1 dekametre (Dm) = .01 Hektometre (Hm) = .001 Kilometre (Km) = .0001 Myriametre (Mm).

1 Mm = 10 Km = 100 Hm = 1000 Dm = 10,000 m;
1 Km = 10 Hm = 100 Dm = 1,000 m;
1 Hm = 10 Dm = 100 m;
1 Dm = 10 m;

1 m = 10 dm = 100 cm = 1000 mm;
1 dm = 10 cm = 100 mm;
1 cm = 10 mm.

SURFACE MEASURES

1 Ar (a) = 100 square metres (sq. m) = .01 hektare (ha);

1 Ar = 1 sq. Dm = 100 square m;
1 sq. Km = 100 Ha = 10,000 A = 1,000,000 sq. m;
1 Ha = 100 A = 10,000 sq. m;
1 A = 100 sq. m.

MEASURES OF CAPACITY

1 litre (l) = 1 cubic decimetre (cdm) = 1,000 cubic centimetres (c. c.) = 0.001 cubic metre (cbm) = 10 decilitres (dl) = 100 centilitres (cl) = .01 hektolitre (hl).

1 Hl = 10 Dl = 100 l = 1,000 dl = 10,000 cl;
1 Dl = 10 l = 100 dl = 1,000 cl;
1 l = 10 dl = 100 cl.

WEIGHTS

1 kilogram (Kg) = 100 dekagrams (Dg) = 1000 grams (g);

1 gram = 10 decigrams (dg) = 100 centigrams (cg) = 1,000 milligram (mg);

1 ton = 1000 Kg = 100,000 Dg = 1,000,000 g;
100 Kg = 10,000 Dg = 100,000 g;
1 Kg = 100 Dg = 1,000 g.

CONVERSION OF U. S. WEIGHTS AND MEASURES TO METRIC AND VICE VERSA

LINEAR

Millimetres to the inch, 25.4001	Inches to the metre, 39.3708
Metres to the foot, .3048	Feet to the metre, 3.2808
Metres to the yard, .9144	Yards to the metre, 1.0936
Kilometres to the mile, 1.6094	Miles to the kilometre, .6214

SQUARE

Sq. centimetres to the sq. inch, 6.452	Sq. inches to the sq. centimetre, .1550
Sq. decimetres to the sq. foot, 9.290	Sq. feet to the sq. metre, 10.764
Sq. metres to the sq. yard, .836	Sq. yards to the sq. metre, 1.196
Hectares to the acre, .4047	Acres to the hectare, 2.471

CUBIC

Cu. centimetres to the cu. inch, 16.387	Cu. inches to the cu. centimetre, .061
Cu. metres to the cu. foot, .0283	Cu. feet to the cu. metre, 35.314
Cu. metres to the cu. yard, .765	Cu. yards to the cu. metre, 1.308

CAPACITY

Cu. centimetres to the fluid dram, 3.70	Fluid drams to the cu. centimetre, .27
Millilitres to the fluid ounce, 29.57	Fluid ounces to the millilitre, 3.38
Litres to the quart, .9464	Quarts to the litre, 1.0567
Litres to the gallon, 3.78521	Gallons to the litre, .26417
Hectolitres to the bushel, .3524	Bushels to the hectolitre, 2.8377

WEIGHT

Milligrams to the grain, 64.7989	Grains to the milligram, .01543
Grams to the ounce avoirdupois, 28.349375	Ounces avoirdupois to the gram, .0352739
Kilograms to the pound avoirdupois, .4536	Pounds avoirdupois to the kilogram, 2.2046
Grams to the ounce Troy, 31.103496	Ounces Troy to the gram, .3215073
Grams to the pound Troy, 373.241954	Pounds Troy to the gram, .00267923

TABLE FOR THE CONVERSION OF METRIC WEIGHTS AND MEASURES INTO ENGLISH

Mètres into yards.		Kilomètres to miles and yards			Litres into galls. and quarts.			Hectolitres into quarts and bushels			Kilogrammes into cwt., qrs., lb., oz.					Hectares into acres, r., p.			
1	1.094	1	0	1094	1	0	0.880	1	0	2.751	1	0	0	2	3 1-4	1	2	1	30
2	2.187	2	1	427	2	0	1.761	2	0	5.502	2	0	0	4	6 1-2	2	4	3	32
3	3.281	3	1	1521	3	0	2.641	3	1	0.254	3	0	0	6	9 3-4	3	7	1	26
4	4.374	4	2	855	4	0	3.521	4	1	3.005	4	0	0	8	13	4	9	3	22
5	5.468	5	3	188	5		0.402	5	1	5.756	5	0	0	11	0 1-4	5	12	1	17
6	6.562	6	3	1282	6	1	1.282	6	2	0.507	6	0	0	13	3 1-2	6	14	3	12
7	7.655	7	4	615	7	1	2.163	7	2	3.258	7	0	0	15	7	7	17	1	8
8	8.749	8	4	1709	8	1	3.043	8	2	6.010	8	0	0	17	10 1-4	8	19	3	3
9	9.843	9	5	1043	9	1	3.923	9	3	0.761	9	0	0	19	13 1-2	9	22	0	38
10	10.936	10	6	376	10	2	0.804	10	3	3.512	10	0	0	22	0 3-4	10	24	2	34
20	21.873	20	12	753	20	4	1.608	20	6	7.024	20	0	1	16	1 1-2	20	49	1	28
30	32.809	30	18	1129	30	6	2.412	30	10	2.536	30	0	2	10	2 1-2	30	74	0	21
40	43.745	40	24	1505	40	8	3.215	40	13	6.048	40	0	3	4	3	40	98	3	15
50	54.682	50	31	122	50	11	0.019	50	17	1.560	50	0	3	26	3 3-4	50	123	2	9
60	65.618	60	37	498	60	13	0.823	60	20	5.072	60	1	0	20	4 1-2	60	148	1	3
70	76.554	70	43	874	70	15	1.627	70	24	0.585	70	1	1	14	5 1-4	70	172	3	37
80	87.491	80	49	1251	80	17	2.431	80	27	4.097	80	1	2	8	6	80	197	2	38
90	98.427	90	55	1627	90	19	3.235	90	30	7.609	90	1	3	2	6 1-2	90	222	1	24
100	109.363	100	62	243	100	22	0.039	100	34	3.121	100	1	3	24	7	100	247	0	18
200	218.727	200	124	487	200	44	0.077	200	68	6.242	200	3	3	20	15	200	494	0	37
300	328.090	300	186	730	300	66	0.116	300	103	1.362	300	5	3	17	6	300	741	1	15
400	437.453	400	248	973	400	88	0.155	400	137	4.483	400	7	3	13	14	400	988	1	33
500	546.816	500	310	1217	500	110	0.193	500	171	7.604	500	9	3	10	5	500	1235	2	11

METRIC EQUIVALENTS

Measures of Length (unit Metre)

EQUAL TO	*Inches*	*Feet*	*Yards*	*Fathoms*	*Miles*
Millimètre	0.03937	0.003281	0.0010936	0.0005468	0.0000006
Centimètre	0.39371	0.032809	0.0109363	0.0054682	0.0000062
Décimètre	3.93708	0.328090	0.1093633	0.0546816	0.0000621
Metre	39.37079	3.280989	1.0936331	0.5468165	0.0006214
Décamètre	393.70790	32.809892	10.9363306	5.4681653	0.0062138
Hectomètre	3937.07900	328.089917	109.3633056	54.6816528	0.0621382
Kilomètre	39370.79000	3280.899167	1093.6330556	546.8165278	0.6213824
Myriamètre	393707.90000	32808.991667	10936.3305556	5468.1652778	6.2138242

Cubic, or Measures of Capacity (unit Litre)

EQUAL TO	*Cubic Inches*	*Cubic Feet*	*Pints*	*Gallons*	*Bushels*
Millilitre, or cubic centimètre.	0.06103	0.000035	0.00176	0.0002201	0.0000275
Centilitre, 10 cubic do.	0.61027	0.000353	0.01761	0.0022010	0.0002751
Décilitre, 100 cubic do.	6.10271	0.003532	0.17608	0.0220097	0.0027512
Litre, or cubic Décimètre.	61.02705	0.035317	1.76077	0.2200967	0.0275121
Décalitre, or Centistère.	610.27052	0.353166	17.60773	2.2009668	0.2751208
Hectolitre, or Décistère.	6102.70515	3.531658	176.07734	22.0096677	2.7512085
Kilolitre, Stère, or cubic mètre.	61027.05152	35.316581	1760.77341	220.0966767	27.5120846
Myrialitre, or Décastère.	610270.51519	353.165807	17607.73414	2200.9667675	275.1208459

Measures of Weight (unit Gramme)

EQUAL TO	*Grains.*	*Troy oz.*	*Avoir. lb.*	*Cwt.* =112 *lb.*	*Tons* =20 *cwt.*
Milligramme	0.01543	0.000032	0.0000022	0.0000000	0.0000000
Centigramme	0.15432	0.000322	0.0000220	0.0000002	0.0000000
Décigramme	1.54323	0.003215	0.0002205	0.0000020	0.0000001
Gramme	15.43235	0.032151	0.0022046	0.0000197	0.0000010
Décagramme	154.32349	0.321507	0.0220462	0.0001968	0.0000098
Hectogramme	1543.23488	3.215073	0.2204621	0.0019684	0.0000984
Kilogramme	15432.34880	32.150727	2.2046213	0.0196841	0.0009842
Myriagramme	154323.48800	321.507267	22.0462126	0.1968412	0.0098421

Square, or Measures of Surface (unit Are)

EQUAL TO	*Sq. Feet*	*Sq. Yards*	*Sq. Perches*	*Sq. Roods*	*Sq. Acres*
Centiare, or square mètre.	10.764299	1.196033	0.0395383	0.0009885	0.0002471
Are, or 100 square mètres.	1076.429934	119.603326	3.9538290	0.0988457	0.0247114
Hectare, or 10,000 square mètres	107642.993419	11960.332602	395.3828959	9.8845724	2.4711431

FOREIGN WEIGHTS AND MEASURES

FRANCE

MEASURE OF LENGTH

1 Myriamètre .... = 10000 Mètres.
1 Kilomètre ..... = 1000 Mètres.
1 Decamètre ..... = 10 Mètres.
1 Mètre ..... = The 10,000,000th part of the quarter of the meridian of the earth.
1 Decimètre ..... = 1-10th of a mètre.
1 Centimètre ..... = 1-100th of a mètre.
1 Millimètre ..... = 1-1000th of a mètre.

MEASURE OF SURFACE

1 Hectare ..... = 100 Ares.
1 Are ..... = 100 Square mètres.
1 Centiare ..... = 1 Square mètre.

MEASURE OF SOLIDITY

1 Stere ..... = 1 Cubic mètre.
1 Decistere ..... = 1-10th of a stere.

MEASURE OF CAPACITY

1 Kilolitre ..... = 1 Cubic mètre.
1 Hectolitre ..... = 10 Decalitres.
1 Decalitre ..... = 10 Litres.
1 Litre ..... = 1 Cubic decimètre.
1 Decilitre ..... = 1-10th of a litre.

MEASURE OF WEIGHT

1 Millia ..... = 1000 Kilogrammes, and is the weight of a ton of sea-water.
1 Quintal ..... = 100 Kilogrammes.
1 Kilogramme .... = Weight of a cubic decimètre of water, at the temperature of 4° above melting ice, or about 40° Fahrenheit.
1 Hectogramme ... = 100 Grammes.
1 Decagramme ... = 10 Grammes.
1 Gramme ..... = 1-1000th of a kilogramme.
1 Decigramme .... = 1-10th of a gramme.

These measures may be compared with the English measures by means of the following table:

1 Mètre ..... = 39.38 English inches, nearly.
1 Are ..... = 3.9 English perches, nearly.
1 Stere ..... = 35.32 English cubic feet.
1 Litre ..... = 1.76 English pints.
1 Gramme ..... = 15.44 English grains.

BELGIUM

The metrical system is used here; but the kilogramme is termed a livre; the litre, a litron; and the mètre, an aune.

NETHERLANDS

Here, also, the metrical system has been adopted; but Flemish names are employed instead of those used in France.

LOMBARDY

The metrical system, with Italian names substituted for most of the original terms, is used officially; but the old measures are also used. See *Venice*.

AUSTRIA

The ell = 30.6 inches. The joch = 1 acre 1.75 rood. The metzen = 1-7 bushel. The eimer = 12.4 gallons. The pfund = 1-2 pound. Gold and silver are weighed by the mark of Vienna, which = 4333 grains.

BASLE

100 pounds = 108.6 pounds avoirdupois. The ohm = 10.7 gallons. The sack = 3.6 bushels. The large and small ells = 46.4 and 21.4 inches respectively.

BAVARIA

The long and short ells = 24 and 23.3 inches respectively. The schaff of 8 metzen = 5.6 bushels. The muid of 48 mass = 15 gallons. 100 pounds heavy and light weight = 108.3 and 104.2 pounds avoirdupois respectively. The mark of Augsburg = 3643 grains.

BREMEN (old)

The foot or half-ell = 11.4 inches. The ohm = 31.5 gallons. The last = 10.2 quarters. 100 pounds = 109.9 pounds avoirdupois.

CAPE OF GOOD HOPE

The centner, or 100 pounds Dutch weight = 108.9 pounds avoirdupois. The leager of 15 ankers = 126.5 gallons. The muid of 2 schepels = 3 bushels. The ell of 27 Rhynland inches = 27.8 inches.

CHINA

The chang of 10 chih = 4 yards, nearly. The shing = 1 pint. 10 ho = 1 shing; 10 shing = 1 tow; 10 tow = 1 hwuh, or 120 catties. The catty = 1.33 pounds avoirdupois. 16 taels = 1 catty; 100 catties = 1 pecul. Liquids are sold by weight; but the English gallon is used in trading with foreigners.

DENMARK

The foot = 12.3 inches. 100 ells = 68.6 yards. The viertel = 1.7 gallons. 100 tonnen = 47.8 quarters. The pound = 1.1 pounds avoirdupois. The pound for gold and silver weighs 7266 grains.

EAST INDIES

Bengal.—The Factory maund = 74.66 pounds avoirdupois. 10 bazar maunds = 11 Factory maunds. 16 chittacks = 1 seer; 40 seers = 1 maund. The guz of 2 cubits = 1 yard.

Bombay.—The maund = 28 pounds avoir-

dupois. 40 seers = 1 maund; 20 maunds = 1 candy. The candy = 24.5 bushels.

Madras.—The maund = 25 pounds avoirdupois. 40 pollams = 1 vi; 8 vis = 1 maund, 20 maunds = 1 candy. The covid = 18.6 inches. The gars of 80 parahs = 16.875 quarters, and weighs 8400 pounds avoirdupois.

EGYPT

The Turkish pike = 27 inches. The ardeb of 24 Cairo rubbie = 6 quarters. The cantar = 100 pounds avoirdupois. 216 drams or 144 meticals = 1 rottole; 100 rottoli or 36 okes = 1 cantar.

FRANKFORT ON THE MAIN (old)

The ell = 21.2 inches. The foot = 11.2 inches. The matter = 3 bushels, nearly. The viertel = 1.6 gallons, nearly. The pound, light and heavy weight = 1.03 and 1.1 pounds avoirdupois. The Zoll-centner = 110.2 pounds avoirdupois. The Cologne mark, used for gold and silver, weighs 3609 grains.

GENEVA (old)

The ell = 45 inches. The acre = 1 acre 1.1 rood. The coupe, or sack = 2.1 bushels. The setier = 10 gallons. The heavy pound = 1.2 pounds avoirdupois; the light pound 1-6th less. The mark weighs 3785 grains.

GENOA

The braccio of 2.5 palmi = 22.9 inches. The mina = 3.3 bushels. The barile = 16.3 gallons. The pound = 0.7 pound avoirdupois. 1.5 pounds = 1 rottole. The pound sottile, for gold and silver, weighs 4891.5 grains.

GREECE

The Venetian measures of length are used, the braccio being called a piche. 100 kila = 11.4 quarters. The cantaro of 40 okes = 112 pounds avoirdupois.

HAMBURG (old)

The foot = 11.3 inches, nearly. 100 ells = 62.6 yards. The scheffel = 1 acre 6 perches. The last = 1.09 last. The viertel = 1.6 gallons. The pound = 1.06 pounds avoirdupois. For the Cologne mark, see *Frankfort.* 2 marks = 1 pound troy.

LUBECK (old)

The ell = 22.9 inches. The last = 11 quarters. The viertel = 1.6 gallon. The pound = 1.07 pounds avoirdupois, nearly.

MALTA

The palme = 10.25 inches; 3.5 palmi = 1 yard; 8 palmi = 1 canna. The salma = 7.8 bushels. The caffiso = 4.5 gallons. The barile = 9.33 gallons. 64 rottoli = 1 hundredweight. The cantaro = 175 pounds avoirdupois.

MAURITIUS

Besides the English weights and measures, those of France before the late alteration are used. The aune = 1.3 yards. The velte = 1.7 gallons. The poid de marc = 1.08 pounds avoirdupois.

NAPLES

The canna = 83.2 inches. The moggia = 3 roods 12 perches. The tomolo = 1.4 bushels. The barile = 9.1 gallons. The cantro grosso and piccolo = 196.5 and 106 pounds avoirdupois, respectively. The pound used in weighing gold and silver contains 4950 grains.

PORTUGAL

The covado = 25.8 inches. The almude = 3.6 gallons. The pound = 1.01 pounds avoirdupois.

PRUSSIA (old)

The ell = 26.5 inches. The morgen = 2 roods 21 perches. The scheffel = 1.5 bushel. The eimer = 15.1 gallons. The pound = 1.03 pounds avoirdupois. The mark of Cologne is used for gold and silver.

ROME

The canna of 8 palmi = 2.2 yards. The canna of 10 palma = 88 inches, nearly. The rubbio = 8.1 bushels. The boccale = 0.4 gallon. The pound = 0.7 pound avoirdupois.

RUSSIA

The arshine = 28 inches. The foot = 13.75 inches. The dessetnia = 2 acres 2.8 roods. The tschetwert = 5.7 bushels. The wedro = 2.7 gallons. The pound = 0.9 pound avoirdupois. The pood = 36 pounds avoirdupois.

ST. GALLEN

The ells for silks and woollens = 31.5 and 24.25 inches, respectively. The mútt of 4 viertels = 2.09 bushels. The eimer = 11.25 gallons. The pound, light and heavy weight = 1.03 and 1.3 pounds avoirdupois, respectively.

SAXONY

The foot = 11.1 inches. The acre = 1 acre 1.5 roods, nearly. The eimer, at Dresden = 14.9 gallons; at Leipsic = 16.8 gallons. The wispel, at Dresden = 69.9 bushels; at Leipsic = 91.7 bushels. The pound = 1.03 pounds avoirdupois.

SICILY

The canna = 76.5 inches. The salma = 7.6 bushels. The barrel = 8 gallons, nearly. The pound of 12 ounces = 0.7 pound avoirdupois. The cantaro = 175 pounds avoirdupois.

SMYRNA

The pike = 27 inches. The killow = 11.3 gallons. The rottolo = 1.2 pounds avoirdupois.

SOUTH AMERICA

The Spanish and Portuguese measures are most generally employed. The use of the English measures prevails in some parts.

SPAIN

The vara, or ell = 33.3 inches. The fanegada = 1 acre 21 perches. The arroba = 3.5 gallons. The fanega = 1.5 bushels. The pound = 1.01 pounds avoirdupois.

SWEDEN AND NORWAY

The ell = 23.3 inches. The tunneland = 1 acre 1 rood, nearly. The tennu = 0.6 quarter. The kann = 0.6 gallon. The pound = 0.9 pound avoirdupois.

TURKEY

The pike = 26.25 inches. The killow = 0.9 bushel. The almud = 1.1 gallon. The oke = 2.8 pounds avoirdupois. The rottolo = 1.3 pounds avoirdupois.

TUSCANY

The braccio = 23 inches, nearly. The saccata = 1 acre 0.9 rood. The sacche = 2 bushels. The fiasche = 4 pints. The pound = 12 ounces avoirdupois.

VENICE

Besides the metrical system, the following measures are used: The braccio, for woollens = 26.6 inches; for silks = 24.8 inches. The stajo = 2.2 bushels. The secchia = 2.4 gallons. The pound sottile = 0.2 pound avoirdupois, nearly; grosso = 1.05 pounds avoirdupois.

REDUCTION OF FRENCH (PARIS), ENGLISH, AND RHENISH MEASURES OF LENGTH, USED BY SCIENTIFIC WRITERS, TO THE SCALE OF EACH

TOISES, REDUCED TO ENGLISH AND RHENISH LENGTHS

TOISES	METRES	ENGLISH FEET	RHENISH FEET
1	1.94904	6.39459	6.21002
2	3.89807	12.78918	12.42004
3	5.84711	19.18377	18.63006
4	7.79615	25.57837	24.84008
5	9.74518	31.97296	31.05010
6	11.69422	38.36755	37.26012
7	13.64326	44.76214	43.47014
8	15.59229	51.15673	49.68016
9	17.54133	57.55132	55.89017
10	19.49037	63.94592	62.10019
100	194.90366	639.45916	621.00194
2000	1949.03659	6394.59160	6210.91941

METRES, REDUCED TO PARIS, ENGLISH, AND RHENISH LENGTHS

METRES	TOISES	PARIS ft.	PARIS in.	PARIS lines	ENGLISH feet	ENGLISH & inches	RHENISH FEET
1	0.51307	3	0	11.296	3	3.3708	3.18620
2	1.02615	6	1	10.592	6	6.7416	6.37240
3	1.53922	9	2	9.888	9	10.1124	9.55860
4	2.05230	12	3	9.184	13	1.4832	12.74480
5	2.56537	15	4	8.480	16	4.8539	15.93100
6	3.07844	18	5	7.776	19	8.2247	19.11720
7	3.59152	21	6	7.072	22	11.5955	22.30340
8	4.10459	24	7	6.368	26	2.9663	25.48960
9	4.61767	27	8	5.664	29	6.3371	28.67580
10	5.13074	30	9	4.960	32	9.7079	31.86200
100	51.30471	307	10	1.600	328	1.0790	318.62000
1000	513.07407	3078	5	4.000	3280	10.7900	3186.19996

A BRIEF HISTORY OF THE UNITED STATES

AMERICA was known to the ancient Northmen as early as the tenth century, but its true discovery dates from the voyage of Columbus, in 1492.

Christopher Columbus, a native of Genoa, having enlisted the assistance of Isabella of Spain, sailed from the port of Palos, on the third day of August, 1492, on his voyage of discovery, with a fleet of three vessels, and a crew of one hundred and twenty men, and landed on the island of San Salvador on the twelfth of October of that year.

Having returned to Spain, where he gave an account of his discoveries to their Majesties, Ferdinand and Isabella, Columbus sailed on the twenty-fifth of September, 1493, on his second voyage, in which he discovered more of the West India Islands.

John Cabot, a Venetian settled in Bristol, claims with Columbus to have been the first discoverer of the Western Continent. With his son Sebastian and two other sons he sailed in the spring of 1497, in search of the northwest passage to India, and discovered land, which he called Prima Vista, or Newfoundland, after which he sailed along the coast of America as far as Chesapeake Bay, and then returned to England.

On the thirteenth day of May, 1498, Columbus set out on his third voyage from the Bay of St. Lucas, and, after sighting some new islands, on the first of August he discovered the continent, but, imagining it to be an island, he termed it Isla Santa.

Americus Vespucius, or Vespucci, from whom the Western Continent derives its name, was a native of Florence, and made four voyages to the New World from 1499 to 1503. After returning to Spain he was appointed by King Ferdinand to draw sea charts descriptive of the New World, from which circumstance the continent became known as America.

Ponce de Leon, a native of Spain, discovered Florida on Easter Sunday (*Pascua Florida,* in Spanish), April 6, 1512.

On September 29, 1513, Balboa, a Spaniard, crossed the Isthmus of Darien and discovered the Pacific Ocean. In the name of the Spanish crown he took possession of all the lands it might touch.

EXPLORATION AND SETTLEMENT

FRANCIS I of France, envious of the glory of Charles V (1524), supplied Verazzano, a noble Florentine, with four vessels to prosecute discoveries in America. After a severe voyage he came upon a coast supposed to be North Carolina. Sailing north he entered a spacious bay receiving a noble river—the Hudson—and following the coast he reached the sites of the future Martha's Vineyard and Boston. Proceeding further, first west and then north, he skirted Nova Scotia, discovered Cape Breton Island, and finally reached the land discovered by the Cabots, Newfoundland and Labrador.

1535.—Jacques Cartier, the discoverer of Canada, sailed from the port of St. Malo, France, and ascended the river St. Lawrence as far as the site of the present city of Montreal.

1538.—The career of Hernando de Soto is one of the most adventurous episodes in the history of American discovery. He accompanied Pizarro to America, and distinguished himself in the severe battle that took place between his chief and Almagro. Having returned to Spain, he was created Captain-General of Cuba and Florida, and sailed in command of a brilliant armament from San Lucar de Barrameda, April 6, 1538, to undertake the conquest of Florida. He arrived at Cuba on the 1st of May, sailed from Havana May 12, 1539, arrived at Espiritu Santo, Florida, on the 25th, and took formal possession of the country in the name of the Spanish Emperor. After being harassed by the Indians, he continued his route to the dominions of the cazique Tuscaloosa, which comprised part of Alabama and Mississippi. Here he fought a disastrous battle on the site of the city of Mobile, and on the 1st of April, 1541, he came in sight of the Mississippi River, which he crossed. In the spring of 1542 De Soto returned to the Mississippi, where, after untold trials and disappointments, he succumbed to fever and fatigue. His body was sunk in the river, lest the Indians should desecrate it.

1542.—Cabrillo made the first voyage along the Pacific coast, sailing as far north as the boundaries of Oregon.

1562.—Admiral Coligni, one of the Huguenot leaders in France, conceived the design of establishing a trans-Atlantic settlement for the purpose of affording an asylum to his Protestant brethren, and fitted out two vessels, which he placed under command of John Ribault, of Dieppe, a seaman of experience. The discoverers landed in Carolina, but the settlement did not prove successful.

1564.—In 1564, Coligni fitted out three vessels, which he placed under the command of Laudonniere, an officer who had accompanied Ribault, which attempt, however, was no more successful than the first. In 1565, Ribault was sent with several ships to supersede Laudonniere, bringing with him large supplies, which induced the colonists to remain.

1565.—Menendez, a Spanish explorer, landed in Florida, and laid the foundations of a colony. It was named St. Augustine, and is the oldest city in the United States.

1576.—Frobisher, an English navigator, tried to find a northwest passage, entered Baffin Bay, and twice endeavored to found a colony in Labrador, but was unsuccessful.

1578.—Sir Francis Drake, a famous English captain, from 1578 to 1580, sailed through the Straits of Magellan and along the Pacific coast as far as Oregon; wintered in San Francisco harbor, and circumnavigated the globe.

1582.—In 1582 New Mexico was explored and named by the Spaniard Espejo, who founded Santa Fé, the second oldest city in the United States.

1584.—Sir Walter Raleigh is distinguished for having projected and established permanent British settlements in North America. In April, he fitted out two ships, fully equipped and provisioned, under the command of Captain Philip Amadas and Arthur Barlow. Having arrived on the American coast, they entered into trade with the natives, and, after a hasty examination of the country, returned to England, where they arrived in September. The country which they discovered was named Virginia, by order of Queen Elizabeth, in allusion to her unmarried state of life. Sir Walter soon fitted out another fleet for America, under the command of Sir Richard Grenville, Mr. Ralph Lane having been appointed Chief Governor of the colony. The Governor returned to England for supplies shortly afterward. Raleigh despatched another colony under John White, who was appointed Governor. Governor White returned to England, and when he came back, three years later, he

found that the entire colony had perished. It is asserted by Camden that tobacco was now for the first time introduced into England, and the potato into Ireland, from America.

1605.—De Monts, a native of France, received a grant of all the land lying between the fortieth and forty-sixth parallels of latitude. The tract was termed Acadia. With Champlain, he founded Port Royal, the first permanent French possession in America.

1606.—James I of England granted the London Company a colony in Virginia in 1606. The expedition reached America in 1607, and, ascending the James River, chose for their colony a spot which they called Jamestown. The colonists and their posterity were declared English subjects, though they were invested with no political rights. The colonists suffered many severe hardships, and were saved from destruction mainly through the energy and sagacity of Captain John Smith, who had been installed as president. This was the first permanent English settlement in America.

1608.—The first permanent French settlement in Canada was established by Samuel de Champlain, who founded the city of Quebec in 1608. In the following year he discovered the beautiful lake which bears his name. He has been justly termed "The Father of New France," as the French possessions in America were named.

1609-10.—In the beginning of the seventeenth century, the Dutch and English directed their attention to the discovery of a northwest passage to India. After the failure of several navigators in this endeavor, it was resumed by Henry Hudson, a navigator in the Dutch service. Not succeeding, he proceeded to explore the American coast, and sailed up the river that now bears his name.

In 1610 he was sent by a Dutch company on another voyage, when he explored the great bay to which his name is attached.

In virtue of Hudson's voyage, the Dutch claimed the country from the Delaware River to Cape Cod, and in 1610 several stations were formed on the Island of Manhattan, the name then given to New York. In 1613, a settlement was founded. The country was called New Netherlands, and a cluster of cottages, where New York now stands, was named New Amsterdam.

1619.—The "first legislative body that ever assembled in America" was called at Jamestown by Governor Yeardley, July 30. Its laws were ratified by the company in England, but possessed no binding force unless subsequently ratified by the colonial assembly. These privileges were, in 1621, embodied in a written constitution, "the first of its kind in America."

1619.—Slavery was introduced into the United States this year by the captain of a Dutch trading vessel, who bought twenty negroes, which he sold to the tobacco planters. Their labor being found profitable, a traffic in slaves soon sprang up.

1620.—After various abortive attempts to colonize New England, a tide of population poured into it from an unexpected quarter. The "Pilgrim Fathers"—Puritans who had fled from England to Holland to escape the persecution of the Established Church—sailed for America in September, 1620, and arrived on the 9th of November, in view of Cape Cod. They settled on a spot which they named New Plymouth. After suffering untold privations, which reduced their numbers in the spring of 1621 to fifty or sixty persons, they persevered, and in the spring of 1624 they counted one hundred and eighty. Their numbers were increased in 1629, and in 1630, fifteen hundred settlers having arrived from England in the latter year. They soon became involved in war with the Indians, which checked the progress of the colony, but the natives were finally subdued and dispersed. In 1692, Plymouth was united with Massachusetts Bay Colony, under the name of Massachusetts.

1622.—On the 22d of March, occurred the Indian Massacre of Virginia, when over three hundred men, women, and children fell victims in a single day.

1630.—The first house erected in Boston, under Governor Winthrop, in July.

Connecticut was settled at Windsor, Hartford, and Wethersfield, in 1633-36.

1633.—Sir George Calvert, Secretary of State under James I, obtained from King Charles I a large grant of land in America, which was named Maryland, in honor of Queen Henrietta Maria. Sir George, now created Lord Baltimore, died before the completion of the charter, and the establishment of the colony devolved accordingly on his son Cecil. The first emigrants, consisting of about two hundred persons, arrived in 1633. The colonists acted justly toward the natives, and the Maryland government was distinguished for proclaiming religious toleration to all. The Protestants having obtained a majority, deprived Cath-

olics of their rights, and declared them outside the protection of the law. In 1691, Lord Baltimore was deprived of his proprietary rights, and Maryland became a royal province. In 1715, under the fourth Lord Baltimore, the government was recovered and religious toleration was restored.

1636.—Rhode Island was settled at Providence in 1636, by Roger Williams, who stamped upon the colonies the idea of religious toleration. In 1647, laws guaranteeing freedom of worship were enacted—"the first legal declaration of liberty of conscience ever adopted in Europe or America."

1638.—The first permanent settlement in Delaware was made in 1638 by the Swedes, on a tract lying near Wilmington. The settlement was subsequently conquered by the Dutch, and later still yielded to the English power.

1643.—In 1643 took place the Union of the Colonies, Massachusetts Bay, New Haven, and Connecticut, for the purpose of common defence against the Indians, and the encroachment of the French and Dutch settlers.

1646.—In 1646 Peter Stuyvesant was appointed Governor of the New Netherlands, which colony continued to thrive under his just and humane rule till its conquest by the English in 1664.

1660.—In 1660, the British Parliament enforced the Navigation Act, whereby the commerce of the colony of Virginia should be carried on in English vessels, and their tobacco shipped to England.

1663.—In 1663, Charles II granted a vast tract of land south of Virginia to Lord Clarendon and other noblemen, which was termed Carolina, in honor of the king. Two settlements were established, Albemarle Colony and Carteret Colony (1670). The two colonies separated in 1729.

1664.—In August, Sir Robert Nichols, who had been sent out by Charles II to effect the conquest of the Dutch possessions in America, arrived before New Amsterdam, having landed a portion of his troops on Long Island. The Governor, Peter Stuyvesant, was unable to offer any effective resistance, and the colony passed into the possession of the English.

1673.—The Jesuit Missionaries were the explorers of the Mississippi Valley. Father Marquette floated in a birch-bark canoe down the Wisconsin to the Mississippi, which he descended to the mouth of the Arkansas.

La Salle, another Jesuit missionary, in 1682, made his way to the Gulf of Mexico, and named the country bordering on the gulf Louisiana, in honor of Louis XIV, King of France.

1682.—The first settlement in Pennsylvania was established by William Penn, an English Quaker. In the following year he purchased land of the Swedes, and laid out on it the city of Philadelphia. He entered into a friendly treaty with the Indians, and the colony flourished apace. After his death, in 1718, his heirs ruled the colony until 1779, when their claims were bought out by the State for the sum of half a million dollars.

1689-97.—King William's War.—In consequence of the war between England and France, in Europe, hostilities between their colonies broke out in America. The savage tribes took part on both sides. The war lasted eight years, during which time several horrible massacres and barbarities took place.

1692.—In 1692, the mania known as the Salem witchcraft broke out, and not till forty-five people had been tortured and twenty hanged was it abated.

1702.—Queen Anne's War.—In this year, England having declared war against France and Spain, the colonies took up the contest. Hostilities continued for eleven years, during which period several fruitless expeditions and horrible massacres took place. Peace was ratified by the treaty of Utrecht.

1733.—Georgia Founded.—The last of the thirteen colonies was planned in 1732, and settled the following year by James Oglethorpe, an English officer, who received a tract of land from George II, which he termed Georgia, in honor of the donor. Georgia became a royal colony in 1752.

1744.—King George's War.—France and England being once more at war, the colonies entered into hostilities also. The war lasted four years, and was concluded by the treaty of Aix-la-Chapelle.

1754-63.—During this period the French and Indian War raged, having originated in the English and French laying claim to the territory west of the Alleghany Mountains. Peace was signed at Paris in 1763, whereby the English acquired all the territory stretching from the Arctic Ocean to the Gulf of Mexico.

1765.—The Stamp Act, which ordered that stamps purchased from the British Government should be placed on all legal documents, pamphlets, newspapers, etc., was

passed in 1765. Resistance to the measure was threatened on all sides. Deputies from nine of the colonies assembled at New York and drew up a Declaration of Rights and a petition to the King and Parliament. The Act was repealed in 1766, but the right to tax the colonies was still asserted.

1768.—In this year the "Mutiny Act" was passed, whereby soldiers were quartered on the inhabitants of the colonies, without the consent of the latter.

1770.—On March 5, 1770, occurred the "Boston Massacre." This was a fight between the soldiers sent by General Gage to quell the incipient resistance of the Bostonians to the "Mutiny Act," and the citizens. Two of the latter were killed and three wounded.

1773.—On December 16, the climax of resistance to the principle of taxation without representation was reached by the colonists, who, disguised as Indians, boarded the vessels in Boston Harbor and cast three hundred and forty-two chests of tea into the water.

1774.—The first Continental Congress met in Philadelphia, September 5. All the colonies, with the exception of Georgia, sent delegates thither. The Congress, by its resolutions, virtually raised the standard of rebellion, and arrayed the colonies against the mother country.

1775.—The battle of Lexington, the first of the Revolution, was fought on April 19, of this year. Seven Americans were killed. The British were assailed on all sides by the surrounding inhabitants, and before their retreat to Boston was completed they had lost three hundred men.

1775.—Bunker Hill, the first regular battle of the Revolution, was fought June 17, and resulted in a victory for the Americans, though they were forced to retire in the end, owing to the exhaustion of their ammunition. On this day General Warren fell.

1775.—Capture of Ticonderoga, May 10, by Ethan Allen and Benedict Arnold. By this surprise large stores of cannon and ammunition fell into the hands of the Americans.

1775.—On the 10th of May, the second Continental Congress met at Philadelphia. It voted to raise twenty thousand men, and on the 15th of June unanimously elected George Washington commander-in-chief.

1775.—Invasion of Canada.—In September, Canada was invaded by the American forces under General Schuyler. General Schuyler, being taken ill, left the command in the hands of General Montgomery, who prosecuted the enterprise. He laid siege to Quebec, and on the morning of the 31st of December endeavored to carry it by assault. He fell at the first fire. The assault was unsuccessful, and the Americans soon after retreated from Canada.

1776.—Evacuation of Boston.—The evacuation of Boston by the British troops, under General Howe, took place on the 17th of March. On the following day Washington entered the city amid general rejoicing.

1776.—June 28.—Attack on Fort Moultrie by an English fleet. The fleet was driven off in a badly shattered condition. Great rejoicing among the colonists, as this was their first encounter with the English navy.

1776.—Declaration of Independence.—On July 4, the report of the committee appointed to draw up a Declaration of Independence was adopted. This Declaration was signed by each of the members of Congress, and by it the thirteen colonies cast off their allegiance to Great Britain and declared themselves an independent people.

1776.—Battle of Long Island.—On the 27th of August, the British Army, thirty thousand strong, under the command of Howe and Clinton, engaged the Americans, who numbered about nine thousand men, commanded by General Putnam, in Brooklyn, L. I. The Americans were defeated with a loss of two thousand men.

1776.—November 16.—Fort Washington captured by the Hessians, after a stubborn defence.

1776.—Battle of Trenton.—After the battle of Long Island, Washington retreated into New Jersey, to prevent the British from capturing Philadelphia. On December 25, it being Christmas night, Washington surmised that the Hessians were not expecting an attack, and, falling upon them in the midst of a plunging storm, surprised them in the height of their revelry, slew their leader, Rall, killed a thousand of their number, and effected his retreat back to camp with a loss of four men, two killed, and two frozen. This defeat of the enemy produced a marked effect throughout the colonies.

1777.—January 3. Battle of Princeton.—In this battle Washington inflicted a serious defeat on the British troops. The Americans suffered severely also, losing one General, two Colonels, one Major, and three Captains, killed. In this battle Colonel Monroe, who afterward became President

of the United States, bore a conspicuous part.

1777.—Battle of Brandywine.—On September 11 the Americans, who had taken up a position at Chad's Ford, on the Brandywine, were attacked simultaneously in front and rear by the British, and, after performing prodigies of valor, were defeated. Philadelphia, in consequence, fell into the hands of the enemy.

1777.—Battle of Germantown, October 4.

1777.—Battles of Saratoga.—On September 19 and October 7, of this year, were fought the battles of Saratoga between the forces of Generals Gates and Burgoyne. The latter was defeated on the 17th, and forced to capitulate, surrendering an army of nearly six thousand men, together with a splendid train of brass artillery, and all the arms and baggage of the troops. In consequence of this defeat, the British were unable to hold possession of the forts on the lakes, and retreated to Isle-aux-Noix and St. John's.

1778.—February 6, treaty with France signed at Paris. The chief articles of the treaty were, that if Britain, in consequence of the alliance, should begin hostilities against France, both countries should mutually assist each other, that the independence of America should be maintained, that if France should conquer any of the British West India Islands they should be deemed her property, that the contracting parties should not lay down their arms till the independence of America was formally acknowledged, and that neither of them should conclude peace without the consent of the other.

1778.—Battle of Monmouth, June 28.

1778.—The Wyoming Massacre.—On the 1st of July, a band of fifteen hundred men, composed of Indians and Tories, under the command of Colonel John Butler, burst into the settlement of Wyoming in the Susquehanna Valley. The able-bodied men being for the most part in the field with the patriot army, there remained none save the old men and boys to make a defence. They were quickly defeated, and, with the women and children, were tomahawked or burned in the flames, after enduring the most savage tortures. The entire settlement was destroyed, and those who escaped the hatchet and the flames forced to fly into the depths of the wilderness.

1779.—Capture of Stony Point.—About midnight, on the 15th of July, General Wayne, with a force of only eight hundred men, performed one of the most brilliant exploits of the war, in the capture of Stony Point. After encountering unexpected difficulties, General Wayne surprised the garrison and compelled them to surrender. The military stores in the fort were considerable.

1779.—On the 22d of August General Sullivan led an expedition into the Genesee Country, and on the 29th fought a battle, near the present city of Elmira, with the Indians and their Tory allies, defeated them, and then laid waste their towns and orchards, so that they might have no inducement again to settle so near the States.

1779.—September 23, capture of the *Serapis* by the *Bon Homme Richard,* under Captain Paul Jones, off the northeast coast of England.

1780.—Surrender of Charleston, May 12, to General Clinton, after a siege of forty days.

1780.—Battle of Camden.—August 16, General Gates having been appointed to take command of the troops of the South, marched to meet Cornwallis near Camden. The armies encountered one another unexpectedly; the American troops were demoralized, defeated, and dispersed through the woods, marshes, and brushwood. By this disastrous defeat, South Carolina and Georgia were again laid prostrate at the feet of the royal army, and the hope of maintaining their independence seemed once more to vanish.

1780.—Arnold's Treason.—General Arnold, whose services at Quebec and Saratoga were so conspicuous, having deemed himself unjustly treated, entered into a plot with the British Major André to hand over West Point to the enemy. André ascended the Hudson, and went ashore on the night of September 21, but was captured at Tarrytown on his return, condemned as a spy, and hanged.

1781.—Battle of Cowpens.—General Tarleton having attacked General Morgan's forces, January 17, at Cowpens, suffered a crushing defeat. Cornwallis set out on the news reaching him to punish the victors and retake the prisoners, but Morgan had meantime effected a retreat into Virginia, and after a close pursuit gained the fords of the Dan.

1781.—Battle of Guilford House, March 15.

1781.—Battle of Eutaw Springs, September 8.

1781.—On the 4th of January, General Arnold, the traitor, who had been de-

spatched by Sir Henry Clinton to prosecute the war in that quarter, landed at Westover, 25 miles below Richmond, with 1,600 men and marched directly toward the city. He burned and destroyed all the property in his line of march, and acted with mingled hate and brutality. Cornwallis soon after took his place, and, after having destroyed ten million dollars' worth of property, took up his position at Yorktown.

1781.—August 30, the combined American and French armies entered Philadelphia.

1781.—Surrender of Yorktown.—On the 28th of September, the combined American and French forces, twelve thousand strong, laid siege to Yorktown. The French fleet in the harbor co-operated with the land forces. After a vain attempt to escape, Cornwallis capitulated to the allied forces on the 19th of October. Exclusive of seamen, nearly 7,000 men surrendered. Seventy-five brass and sixty-nine iron cannons, with a large amount of ammunition and military stores, fell into the hands of the allies; while one frigate, two ships of twenty guns, a number of transports and other vessels, with about 1,500 seamen, surrendered to the French Admiral, Count de Grasse. This virtually ended the war.

1783.—Peace Declared.—On September 3, a treaty of peace was signed at Paris, acknowledging the independence of the United States.

1783.—Savannah evacuated by the British, July 11.

1783.—On November 25, the British evacuated New York, and an American detachment under General Knox took possession of the town.

1787.—Adoption of the Constitution.—A stronger national government than that which existed being needed and desired, a Convention was called in Philadelphia, September 17, to revise the Articles of Confederation. Washington was chosen President. After much deliberation an entirely new Constitution was adopted. During the year 1788, nine States, the number required to make it binding, had ratified the Constitution, and the same year the government was organized under the new instrument, and in 1789 it went into operation.

1789.—April 30.—Washington inaugurated first President of the United States. He took the oath to uphold the Constitution of the United States on the balcony of the old Federal Hall, in the city of New York, which was then the temporary capital.

1794.—Whiskey Rebellion in Western Pennsylvania.—The tax imposed on whiskey to restore the nation's shattered finances provoked considerable opposition, and in Pennsylvania the rioters had to be subdued by the militia. No blood was shed, however.

1795.—Jay's treaty with England ratified by the Senate June 24, after prolonged opposition.

1795.—Treaty with Spain, whereby the United States secured free navigation of the Mississippi, and the boundary of Florida was fixed.

1795.—Treaty with Algiers by which American captives were released and the Mediterranean commerce was made free to American vessels.

1796.—Tennessee, the sixteenth State, was admitted into the Union June 1. Two years previously it had been granted distinct territorial government.

1797.—On the 4th of March, John Adams was inaugurated second President of the United States. He was opposed by Thomas Jefferson, whom he defeated by two electoral votes.

1799.—Death of Washington.—On the 14th of December, George Washington died at Mount Vernon, his home, in Virginia, after a brief illness.

1800.—The capital was removed to Washington in this year.

1801.—Inauguration of Jefferson.—Thomas Jefferson was inaugurated third President of the United States, March 4. He was the chief author of the Declaration of Independence and the embodiment of the principles of Democracy.

1801.—War Against Tripoli.—The Bashaw of Tripoli, who had been accustomed to receive annual tribute from the United States for immunity from his piratical cruisers, declared war against the United States in this year. The United States despatched a fleet thither in 1803, which bombarded the city of Tripoli, and compelled a treaty of peace in 1805.

1802.—Ohio, the seventeenth State, was admitted to the Union on November 29. It was first explored by the French, under La Salle, in the year 1680.

1803.—The Louisiana Purchase.—Louisiana Territory, embracing most of the region west of the Mississippi, and covering an area of over a million of square miles, was purchased from France, under Napoleon, on the 30th of April, for the sum of $15,000,000.

1804.—Death of Alexander Hamilton, who fell in a duel with Aaron Burr, at Weehawken, New Jersey, July 11.

1807.—Robert Fulton's steamboat, the *Clermont,* made her memorable trip from New York to Albany, on September 14. This was the first steam vessel ever launched.

1807.—The American frigate *Chesapeake* was fired into by the British frigate *Leopard* off the coast of Virginia, June 22. This act was perpetrated in sustainment of a pretension of the English to the right of searching American vessels and impressing British subjects found therein into the English service. The immediate result of this outrage was an embargo laid on American ships by Congress and the suspension of all intercourse with England.

1809.—James Madison was inaugurated fourth President of the United States, March 4.

1811.—Battle of Tippecanoe.—The battle of Tippecanoe was fought November 7, between General Harrison and a confederacy of the Indian tribes under Tecumseh, a famous chief. The Indians had been instigated to this war by British emissaries. The Indians were defeated and dispersed.

1812.—Louisiana, the eighteenth State, was received into the Union April 8. The territory was so named in honor of Louis XIV, King of France.

1812.—War with Great Britain.—The British Government continued to seize American vessels and impress our seamen. On the 19th of June, the United States declared war against Great Britain. On the 16th of May previous the American frigate *President,* having hailed the British sloop *Little Belt,* was fired upon by the latter. A fight ensued, in which the British sloop was disabled. All hope of a peaceful termination of the difficulty was thereby rendered impossible.

1812.—Canada was invaded by General Hull July 12. On the approach of the British and Indians he retreated to Detroit, which, with the whole of Michigan, he, in a most cowardly manner, surrendered to the enemy, August 16, with all its garrison and stores.

1812.—The battle of Queenstown Heights was fought October 13. The English were dislodged and their general, Brock, killed, but not being sustained by the American militia, who refused to cross over from their State, the Americans on the Canada side were compelled to surrender, after a heroic struggle.

1812.—August 19, the British frigate *Guerriere* was captured, after a hard fight, by the United States frigate *Constitution* (Old Ironsides) off the coast of Massachusetts, Captain Hull commanding.

1812.—October 13, capture of the English brig *Frolic,* off the coast of North Carolina, by the American sloop-of-war *Wasp.*

1813.—September 10 was made memorable by Captain Perry's brilliant victory over the British on Lake Erie. The American flotilla consisted of nine vessels, carrying fifty-four guns; that of the enemy, six vessels and sixty-three guns. Perry's famous message after the battle was: "We have met the enemy and they are ours."

1813.—The American frigate *Chesapeake* captured by the British ship *Shannon,* June 1.

1813.—Battle of the Thames, October 5. This battle was fought between the forces of General Harrison and the British under Proctor, and their Indian allies under the famous chief Tecumseh. The enemy was defeated, Tecumseh being among the slain. This victory, in connection with Perry's triumphs on Lake Erie, virtually decided the issue of the war.

1814.—Massacre of Fort Mimms.—This deed was perpetrated by the Creek Indians, August 30, who broke in upon the garrison and slew all, including women and children. General Jackson was sent with a force against the Indians, and, falling on them at Horseshoe Bend, slew six hundred of their number and compelled them to make peace.

1814.—Battle of Chippewa, July 5, gained by the Americans under General Scott.

1814.—Battle of Lundy's Lane, July 25. This battle resulted in a victory for the Americans.

1814.—Battle of Lake Champlain, September 11. The American squadron, under the command of Commodore McDonough, almost wholly destroyed the British fleet in this conflict. Simultaneous with this signal victory, the American forces, numbering only fifteen hundred men, repelled the advance of General Prevost, the British commander in Plattsburg, at the head of twelve thousand veterans, who had served under Wellington.

1814.—Washington captured by the British, August 24. The Capitol was burned, and the Congressional Library, together with several public and private buildings, shared the same fate.

1814.—Treaty of peace with England, December 24. The treaty was signed at Ghent.

1815.—Battle of New Orleans. Though a treaty of peace had been signed on the 24th of December, at Ghent, the intelligence

had not yet arrived in America. On the 8th of January, General Packenham, with an army of twelve thousand veteran troops, sustained by a powerful fleet, marched to the attack of New Orleans. General Jackson, with a force of scarce half that number, mostly raw recruits, inflicted an overwhelming defeat on the invaders. General Packenham was slain, and while the British lost over two thousand of their number, the American loss was but seven killed and six wounded.

1815.—In May, Decatur was sent with a squadron to chastise the Algerines, who had renewed their piratical practices during our war with England. He obtained the liberation of all the American prisoners held by the Barbary States, with complete indemnity for all losses inflicted.

1816.—Indiana, the nineteenth State, was admitted to the Union on December 11.

1817.—James Monroe inaugurated fifth President of the United States, March 4.

1817.—Mississippi, the twentieth State, was received into the Union on December 10. The State derived its title from the great river of that name.

1818.—Illinois, the twenty-first State, was admitted to the Union on December 3. It derives its name from its greatest river, which signifies "The River of Men."

1819.—Alabama, the twenty-second State, was admitted to the Union on December 14. It derives its name from the Indian phrase, signifying "Here we rest."

1819.—Florida ceded by Spain to the United States, February 22. The treaty was not signed by the King of Spain until October 20, 1820, and the United States did not enter into full possession until July 17, 1821.

1820.—The Missouri Compromise passed March 3. This was the settlement of the difficulty that arose regarding the question of slavery, on the proposal of admitting Missouri into the Union. Through the efforts of Henry Clay, it was admitted as a s' .v State, under the compromise that slavery should be prohibited in all the other territories west of the Mississippi and north of the southern boundary of Missouri.

1820.—Maine, the twenty-third State, was admitted to the Union on March 15.

1821.—Missouri, the twenty-fourth State, was admitted to the Union on August 10. It derives its name from its principal river, which signifies "muddy water."

1824.—Lafayette's visit as "the Nation's guest," August 15. He was received with the most joyous welcome in all the States.

1825.—John Quincy Adams inaugurated sixth President of the United States, March 4. Four candidates being in the field, and none of them obtaining a majority of votes, the election went to the House of Representatives.

1826.—Thomas Jefferson and John Adams, ex-Presidents, died July 4.

1829.—Andrew Jackson inaugurated seventh President of the United States, March 4. He was distinguished for his honesty, tenacity of purpose, and his thorough American spirit.

1832.—Nullification Ordinance passed by South Carolina threatening secession from the Union, in the event of force being employed to collect the revenue at Charleston. A settlement was effected by the acceptance of Henry Clay's "Compromise Bill."

1832.—Black Hawk War.

1835.—The Florida War.—A war with the Seminole Indians broke out this year. It arose from a refusal of the Indian chief, Osceola, to move west of the Mississippi, in accordance with a treaty. He plotted a wholesale massacre of the whites, in which Major Dade and one hundred men were slain. The Indians retreated to the everglades of Florida, where they were pursued and defeated by Taylor, at the Battle of Okechobee, December 25.

1835.—Great fire in New York, December 16. Six hundred stores burned. Loss, $18,000,000.

1836.—Arkansas, the twenty-fifth State, was admitted to the Union on June 15. Its name is derived from an extinct Indian tribe.

1837.—Michigan, the twenty-sixth State, was received into the Union on January 26. The name is Indian, signifying "Great Lake."

1837.—Martin Van Buren, the eighth President of the United States, inaugurated March 4. During his term of office a terrible financial crisis prevailed throughout the country. In two months alone in the city of New York the losses amounted to $100,000,000. 8

1841.—William H. Harrison inaugurated the ninth President of the United States, March 4. One month after, April 4, he died. 9

1841.—John Tyler, the Vice-President, inaugurated tenth President of the United States, in accordance with the Constitution, April 6. 10

1842.—Ashburton treaty, by which the northeast boundary between Maine and New Brunswick was settled. The commis-

sioners on each side were Lord Ashburton and Daniel Webster.

1842.—Dorr's Rebellion, a difficulty which arose from the endeavor to secure a more liberal Constitution in Rhode Island. This was secured in 1843.

1844.—Anti-Rent Rebellion in the State of New York.—The occupants of the old "patroon" estates refused to comply with the feudal customs of the Patroon landlords, and resisted and killed the officers sent to serve warrants on them. The disturbances had to be quelled by the militia, and the allodial was substituted for the feudal tenure.

1845.—Florida, the twenty-seventh State, was admitted to the Union on March 3.

1845.—James K. Polk inaugurated eleventh President of the United States on March 4.

1845.—Joe Smith, the Mormon Prophet, killed, and the Mormons driven away from Nauvoo City, Illinois, by the mob.

1845.—Texas, which had wrested its independence from Mexico, and applied for admission to the Union, was received into the family of States, December 27.

1846.—Battle of Palo Alto.—The Texas boundary having given rise to a dispute between the United States and Mexico, General Taylor was ordered to occupy the disputed territory with his troops. He was attacked by the Mexicans, with a superior force, May 8, at Palo Alto. The latter were defeated. General Taylor fought the battle of Resaca de la Palma the following day, and gained a signal victory.

1846.—War declared against Mexico by Congress, May 11.

1846.—Capture of Monterey, with its garrison of ten thousand men, by General Taylor, with a force of six thousand, September 24.

1846.—Iowa, the twenty-ninth State, was admitted to the Union on December 28.

1846.—Conquest of New Mexico and California by Captain John C. Fremont, assisted by Commodores Sloat and Stockton, and General Kearney.

1847.—Battle of Buena Vista, fought between a portion of General Taylor's command, and twenty thousand Mexican troops, under Santa Anna, February 23. After a desperate struggle, lasting the entire day, the American troops, though vastly outnumbered, were victorious.

1847.—Capture of Vera Cruz, by General Scott, after a furious bombardment of four days, March 29.

1847.—Battle of Cerro Gordo, April 18.

1847.—Battle of Contreras, August 20.

1847.—Capture of Chapultepec, September 13.

1847.—Surrender of Mexico to the American army, September 14.

1848.—Treaty of Peace with Mexico, February 2. By this treaty the United States acquired the territory stretching south to the Gila, and to the Pacific on the west.

1848.—Gold was discovered in California in February, and soon attracted a tide of immigration from Europe, Asia, Australia, South America, and all parts of the United States. Towns and settlements grew up as if by magic. More than one hundred thousand persons flocked to the mines from the United States within eighteen months after the discovery of the precious metal.

1849.—General Zachary Taylor, the twelfth President of the United States, was inaugurated March 5.

1850.—Death of President Taylor, July 9.

1850.—Millard Fillmore, the Vice-President, inaugurated thirteenth President of the United States in accordance with the Constitution, July 16.

1850.—California, the thirty-first State, was admitted to the Union on September 9.

1853.—Franklin Pierce, the fourteenth President of the United States, inaugurated March 4.

1854.—Kansas-Nebraska Bill passed in May. This Bill was a virtual nullification of the Missouri Compromise Bill. It provided that the inhabitants of each Territory should decide whether the State should enter the Union as a free or a slave State.

1854.—A Treaty with Japan was secured in May by Commodore Perry, whereby the United States were granted two ports of entry in that exclusive country.

1857.—James Buchanan, the fifteenth President of the United States, was inaugurated March 4.

1858.—Minnesota, the thirty-second State, was admitted to the Union on May 11. It derives its name from the Indian word signifying "cloudy water."

1859.—Oregon, the thirty-third State, was received into the Union on February 14. Its name is of Spanish origin.

1860.—Secession of South Carolina.—On the election of Abraham Lincoln to the Presidency, the Southern leaders prepared to carry out their threats of secession from the Union. On December 20, South Carolina withdrew, and was soon followed by Mississippi, Florida, Alabama, Georgia, Louisiana, and Texas. The act of secession was the outcome of the question of

State rights in regard to slavery, which had vexed the country almost from the formation of the Union.

1861.—Kansas, the thirty-fourth State, was admitted to the Union on January 29. The name is derived from an Indian term, signifying "smoky water."

1861.—Southern Confederacy Inaugurated. —On the 4th of February delegates from the seceded States met at Montgomery, Alabama, and formed a government known as the "Confederate States of America." Jefferson Davis, formerly a United States Senator from Mississippi, was chosen President, and Alexander H. Stevens, of Georgia, was chosen Vice-President. All the national property and munitions of war belonging to the United States, situated in the seceded States, were seized and held.

1861.—Abraham Lincoln, the sixteenth President of the United States, inaugurated March 4.

1861.—Attack on Fort Sumter, April 12. —The *Star of the West*, an unarmed steamer, bearing supplies to Major Anderson's garrison in Fort Sumter, had been fired upon and driven back, January 9. At the same time the Southern leaders declared that any attempt to relieve Fort Sumter would be regarded as a declaration of war. At length General Beauregard opened fire on the fort on the morning of the 12th of April, and after a contest of thirty-seven hours the garrison surrendered. The garrison numbered only seventy men, while the besieging force was seven thousand.

1861.—Call for seventy-five thousand volunteers by President Lincoln to suppress the rebellion, April 15.

1861.—Seizure of Harper's Ferry by Confederate troops, April 18.

1861.—Seizure of the Norfolk Navy Yard by the Confederates, April 20.

1861.—Massachusetts troops attacked in the streets of Baltimore, April 19. First blood shed in the Civil War on the anniversary of Concord and Lexington.

1861.—The Confederate Congress assembled at Richmond, Virginia, July 20.

1861.—Battle of Bull Run, Virginia, July 21.—The Federal troops having driven the enemy from the field after a sharp contest, were suddenly attacked in flank and thrown into a panic. The retreat was changed to a rout, arms and munitions being abandoned, the fugitives flying in all directions. The effect of this battle was to convince the Northern people of the desperate nature of the great conflict that had just opened. Congress immediately voted $500,000,000 and 500,000 men to prosecute the war.

1862.—Capture of Fort Donelson, with its garrison of fifteen thousand men, by General Grant, February 16.

1862.—Battle of Shiloh (April 6 and 7).

1862.—Capture of New Orleans by Captain Farragut, April 25.

1862.—Battle of the *Merrimac* and the *Monitor*, March 9. This was the first battle ever fought between ironclad ships.

1862.—Invasion of Maryland by the Confederate forces under General Lee, September 5.

1862.—Battle of Antietam, September 17. This was one of the bloodiest conflicts of the war, and, though the result could scarcely be said to be decisive, the effect was a Federal victory. Lee was forced to retire across the Potomac, and Washington was no longer threatened.

1862.—Battle of Fredericksburg, December 13, overwhelming defeat of Union troops; Federal loss twelve thousand.

1862.—While the Civil War was at its height, the Sioux Indians took to the warpath, and perpetrated horrible massacres in Minnesota, Iowa, and Dakota. They were finally routed by Colonel Sibley, and several of their number taken prisoners and hanged.

1862.—Battle of Murfreesboro, December 31, and January 2. This was one of the fiercest battles of the war, the loss being stated as one-fourth of the number engaged. The Confederates were compelled to retreat.

1863.—Emancipation Proclamation, declaring freedom to the slaves, issued by President Lincoln, January 1.

1863.—Battle of Chancellorsville, Virginia, May 2-3.

1863.—West Virginia, the thirty-fifth State, was admitted to the Union on June 20. This portion of Virginia remained loyal to the Union during the war, and was accordingly incorporated into a separate State.

1863.—Battle of Gettysburg, Pennsylvania, July 1-3. This was the bloodiest and most desperately contested struggle of the Civil War. The loss on both sides numbered about fifty thousand men. Lee was forced to retreat beyond the Potomac, and a Northern invasion was no longer thought of. The backbone of the rebellion was broken.

1863.—Surrender of Vicksburg with 37,000 prisoners of war, July 4. This was one of the most important events of

the war. By its capture the Confederacy was cut in two and the Mississippi opened to the Gulf.

1863.—Battle of Chickamauga, September 19-20.

1863.—Battle of Chattanooga, Tennessee, November 24-25.

1864.—Battle of the Wilderness, May 5-6.

1864.—Battle of Spottsylvania, May 8-12.

1864.—Battle of Cold Harbor, June 3. Twenty minutes after the battle had opened, ten thousand Union soldiers had fallen.

1864.—Capture of Atlanta, Georgia, by General Sherman, September 2.

1864.—Nevada, the thirty-sixth State, was received into the Union, October 31. The name is of Spanish origin.

1864.—Battle of Nashville, December 15-16.

1865.—Capture of Petersburg and Richmond, April 2-3, by the forces of General Grant.

1865.—Surrender of General Lee, at Appomattox Court House, Virginia, April 9. This event brought the Civil War to a close.

1865.—Assassination of President Lincoln, April 14. This black deed was perpetrated by Wilkes Booth, in Ford's Theatre, Washington, where the President occupied a box. It was the act of the crazed brain of one who, thinking he was ridding the country of a tyrant, struck an almost deadly blow at the now vanquished South, in the murder of her most powerful friend.

1865.—Andrew Johnson, the Vice-President, inaugurated seventeenth President of the United States, in accordance with the Constitution, April 15.

1865. The Thirteenth Amendment, declaring the abolition of slavery, adopted as a part of the Constitution of the United States, December 18.

1867.—Nebraska, the thirty-seventh State, admitted to the Union on March 1.

1867.—Death of Maximilian, so-called Emperor of Mexico, June 19. During the American Civil War, Napoleon III sought to found an empire in Mexico, and established Maximilian, of the House of Austria, Emperor, with the aid of French troops. This the Americans regarded as a violation of the "Monroe Doctrine," and after the close of the war they compelled the French Emperor to withdraw his troops from the neighboring republic. Deprived of foreign aid, Maximilian's régime was overthrown by the Mexicans and the unfortunate monarch shot.

1867.—Purchase of Alaska from Russia by the United States Government for the sum of $7,200,000 in gold.

1868.—Impeachment of President Johnson, February 24. The order to impeach the President was made in consequence of the latter having attempted to remove the Secretary of War, a proceeding which was held to be in violation of the Tenure-of-Office Bill, which had some time previous been passed over the President's veto. After a protracted trial, President Johnson was acquitted, having escaped conviction by one vote.

1868.—The Fourteenth Amendment, whereby equal rights were guaranteed to all, irrespective of race or color, was adopted by Congress, July 28.

1868.—Treaty between China and the United States, whereby valuable commercial privileges were acquired by the latter.

1869.—Ulysses Simpson Grant, the eighteenth President of the United States, inaugurated March 4.

1869.—Completion of the great transcontinental railroad from New York to San Francisco.

1870.—The Fifteenth Amendment, whereby the right of suffrage is guaranteed to all, regardless of race, color, or previous condition of servitude, was formally announced as part of the Constitution, March 30.

1870. The Treaty of Washington ratified, whereby Great Britain was compelled to pay the United States the sum of $15,500,000 in gold, in consideration of damages caused to American commerce by the *Alabama* and other Confederate cruisers fitted out in English ports during the Civil War.

1870.—Rejection by Congress of the proposed annexation of San Domingo to the United States.

1871.—Great fire broke out in Chicago, October 8. Three thousand acres of the city devastated, $200,000,000 of property destroyed, and a hundred thousand people left homeless.

1872.—Great Boston fire, November 9. Sixty acres of the business portion of the city laid waste and $70,000,000 of property destroyed.

1873.—Difficulties with Modoc Indians. After despatching troops against them, Captain Jack and several of the leaders were captured, and executed October 3.

1875.—Colorado, the thirty-eighth State, received into the Union, March 3.

1876.—Centennial Exhibition of the "arts and industries of all nations," at Philadelphia, opened May 10. The exhibition

lasted six months, and had an average daily attendance of 61,000 persons.

1877.—War with the Sioux Indians.—The Indian reservation being encroached on by gold prospectors, it led to difficulties which terminated in compelling a despatch of regular troops to the reservation. General Custer and his entire command were slain in the conflict, which occurred on the twenty-fifth of June, on the Little Big Horn River.

1877.—Rutherford B. Hayes, the nineteenth President of the United States, inaugurated March 4.

1881.—James A. Garfield, the twentieth President of the United States, inaugurated March 4.

1881.—Assassination of President Garfield, July 2, by Charles J. Guiteau, at the railroad depot, Washington. The assassination was regarded as the act of a crazed brain. The wounded President was removed to Long Branch, N. J., where he died on the 19th of September following.

1881.—Chester A. Arthur, Vice-President, inaugurated twenty-first President of the United States, in accordance with the Constitution, September 20.

The centennial anniversary of the surrender of Cornwallis at Yorktown was celebrated October 19, 1881. One month previous England had mourned with us over the death of President Garfield, and in recognition and grateful acknowledgment of the friendly feelings manifested upon that occasion, President Arthur directed that during the Yorktown celebration a national salute should be fired in honor of the flag of Great Britain. France, naturally and historically, had a place in the anniversary whose event her aid alone made possible. The Stars and Stripes floated in peaceful company with the cross of St. George and the lilies of France on the field of Yorktown, where, one hundred years before, the decisive battle of the Revolution was fought.

The steam yacht *Jeannette*, fitted out by James Gordon Bennett, left San Francisco, July 8, 1879, under the command of Lieutenant G. W. DeLong, on an expedition into the Arctic regions. The vessel was caught in the ice soon after entering the Arctic Sea, floated about helplessly for more than twenty-one months, and sank June 13, 1881. The nearest coast was Siberia, some four hundred miles distant. On sleds and boats mounted on runners the men started southward over the ice in three parties. The party under Lieutenant Danenhower and Chief Engineer Melville entered the Lena River and was rescued by the natives. That under Lieutenant DeLong perished of hunger and cold on the delta of the Lena. The other party was never heard from.

At Lady Franklin Bay a Signal Service station was established under Lieutenant A. W. Greely in the summer of 1881, for the purpose of investigating the meteorology of the Arctic regions. Several exploring parties were sent out, one under Greely. Supplies expected did not arrive, and the Greely expedition returned southward in August, 1883. They went into winter quarters at Cape Sabine, where their only food for several weeks was moss and lichens and sealskin broth. June 22, 1884, when the relief squadron under Commander Schley found the party, only seven of the original twenty-five members were alive. Though the party continued to die off, one by one, explorations were continued, and the results of the expedition have proved of great value to science.

The Signal Service of the United States, under General William B. Hazen, who was appointed December 8, 1880, began in 1881 to be recognized as a very important department. Signal Service stations were established at various points and equipped with the latest appliances for correct observations. Results were telegraphed to Washington, and the workings were soon regulated with methodical exactness. The track of storms across the continent is now so clearly marked out from day to day, and the laws of climatic movements and developments are so well understood, that data are easily obtainable for forecasting the time and nature of any important meteorological change likely to occur in any part of the country.

By a disastrous flood in the Mississippi Valley, in the spring of 1882, 100,000 persons were made homeless. The appropriations by Congress to relieve the distress of the sufferers were liberal and timely, and the sums contributed by all the people were princely and unstinted.

The suspension bridge between New York and Brooklyn was opened May 24, 1883, having been begun January 3, 1870. The roadway is 85 feet wide and 5,989 feet long. The towers are 278 feet high. The suspended span, from tower to tower, is 1,596 feet long, and its height above the East River at high tide is 135 feet. Each of the four cables is 15 3-4 inches in diameter, containing 5,296 parallel galvanized steel, oil-coated wires, and weighing, with its covering, 897 1-8 tons. The strength of

the four cables is estimated at 48,800 tons. The Brooklyn Bridge railway is operated by an endless wire rope. The railroad fare one way is three cents. Foot passengers are free

Important measures passed by the Forty-seventh Congress (1881-83) were: a civil service bill regulating the method of appointment and promotions in the civil service of the United States by means of a system of examinations, and a bill reducing single letter postage from three cents to two cents per half-ounce.

Important measures passed by the Forty-eighth Congress (1883-85) were: a bill increasing from one-half an ounce to one ounce the maximum weight of a letter to be carried for two cents; a bill constituting Alaska a civil and judicial district, with temporary seat of government at Sitka, providing for the appointment of a governor, judge, marshal, and other officers to serve four years, without authorizing a legislative assembly or a territorial delegate in Congress.

A World's Industrial and Cotton Exposition was held at New Orleans in the winter of 1884-85. It was intended to commemorate the centenary of the cotton industry in this country. President Arthur, in the presence of distinguished men in the Executive Mansion at Washington, opened the exposition by telegraph. The exhibition was a great success, the exhibits from Mexico, West Indies, and Central and South America attracting special attention.

The administration of President Cleveland (1885-89) was marked by frequent efforts to change the economic policy of the government on the subject of the tariff. The Mills Bill, providing for the reduction of duties on imports to a revenue basis, failed to become a law. Cattle drovers were excluded from the government lands in the Far West. Many new cruisers were projected and built. The progress of the country was satisfactory and the policy of the administration conservative. General Grant died July 23, 1885, at Mount McGregor, N. Y., sincerely mourned by the entire reunited nation and eulogized in many quarters as the foremost military chieftain of the century.

In the fall of 1888 Hon. Benjamin Harrison of Indiana was elected over President Cleveland. President Harrison's administration (1889-93) was marked by many stirring events and important public acts. Six new States were admitted into the Union. The McKinley Bill, a protective tariff measure, became a law. The Congressional election of 1890 returned an extraordinary Democratic majority to the House of Representatives. The World's Fair site was located in Chicago, and buildings and improvements were erected and projected there on a scale never before witnessed in the civilized world. The census of 1890 showed a population of nearly 63,000,000. Chicago passed the 1,000,000 mark. Chili paid $75,000 indemnity for man-of-war's men killed and injured by a mob in Valparaiso, and Italy was paid a liberal indemnity for the death of Italian citizens in the Mafia massacre at New Orleans.

The summer and autumn of 1892 witnessed the following among other stirring events—viz.: Civil war in Tennessee on the subject of convict labor in the mines, which was put down after much reprehensible delay on the part of the State authorities; riotous violence in mining regions near Cœur d'Alene, Idaho, resulting in much bloodshed and not suppressed until many fiendish acts of cruelty had been committed by the rioters; a switchmen's strike at Buffalo, in which nearly all the railroads centring at that point were involved, and which developed such serious conditions that the major portion of the State militia was despatched to the scene, the result being the unconditional declaring off of the strike, after much loss of property and disquietude in the public mind had been caused; a great lockout-strike at the Carnegie Mills in Homestead, Pa., by which nearly four thousand men were thrown out of employment and several lives lost in a battle between Pinkerton guards and strikers, the State militia of Pennsylvania finally taking possession of the town and mills; as a final settlement, the leaders of the strikers were arrested on charges of murder and treason, and some of the officials of the mills were charged with conspiracy; the struggle of American seaports, especially New York, against the cholera invasion from Hamburg, Russia, and France, resulted in a signal victory for the vigilance of the great metropolis. President Harrison and ex-President Cleveland were again the opposing candidates for the Presidency.

A treaty between the United States and Chili, under which all disputes between the two countries, including claims of American citizens for damages during the Chili-Peru War, were to be settled by arbitration, was negotiated by Minister Egan, and was to be submitted to the President and Senate as soon as possible after Congress met in December, 1892.

The issues between the Democratic and

Republican parties were clearly defined in the Presidential and Congressional campaign of 1892. The Republicans favored the protective principle in tariff legislation, on the ground that American industries will be thereby built up. They also favored a Federal Elections Bill, giving the Federal authorities the right of supervision over Congressional and Presidential elections. On the tariff question the Democrats sharply declared their opposition to any but a tariff for revenue only, and solely for the needs of the government economically administered. They opposed the proposed Federal Elections Bill on the ground that it authorized needless interference with the individual and was liable to be abused so as to give the Federal authorities undue power to perpetuate themselves in office.

In the ensuing election ex-President Grover Cleveland was re-elected.

The first important happening in 1893 was the opening of the World's Columbian Exposition at Chicago in May. The formal dedication had taken place in October, 1892, and the Exposition was held to commemorate the four hundredth anniversary of the discovery of America by Columbus. The Exposition lasted for six months, cost a little more than $31,000,000, and tnere were more than 21,000,000 paid admissions.

In the spring of the same year, President Cleveland called a special session of Congress, which repealed the law obliging the Government to purchase for coinage 4,500,000 ounces of silver each month.

In January, 1893, revolutionists in Hawaii, having deposed Queen Liliuokalani, the government *de facto* of the islands applied for admission to the United States. Believing that the revolutionists had been improperly assisted by the American Minister, President Cleveland blocked annexation and tried to have the Queen restored, but the revolutionists declared the Republic of Hawaii on July 4, 1894.

In 1895, on account of a disputed boundary line between Venezuela and British Guiana, this country came perilously near to a war with Great Britain. The latter country was urged by our State Department to submit the matter to arbitration, but seemed disinclined so to do. In December, 1895, President Cleveland sent to Congress a message, in which he declared that war with Great Britain was preferable to any surrender of the Monroe Doctrine. This message created astonishment and consternation in England, where there had been no idea previously that war with the United States was possible. An American Commission was appointed to discover the true location of the disputed boundary line, but before this Commission had had time to make its report, Great Britain signed a treaty of arbitration, in February, 1897, and an important precedent in favor of the Monroe Doctrine was thereby established.

In 1896 another Presidential contest took place. William McKinley of Ohio and Garret A. Hobart of New Jersey headed the Republican ticket, on a platform calling for the maintenance of the existing gold monetary system. William J. Bryan of Nebraska and Arthur Sewall of Maine represented the Democratic party, on a platform favoring the unlimited free coinage of silver at a ratio of 16 to 1. McKinley and Hobart were elected.

The first important act of McKinley's Administration was the passage of a tariff act repealing the Gorman-Wilson Bill of 1894, and substituting a method of "protection," which, in its essential features, reproduced the McKinley Bill of 1890. This bill became a law July 24, 1897.

In 1895 another revolution against Spanish authority broke out in Cuba. Spain's conduct of the war aroused such indignation in this country that Congress passed a resolution acknowledging the belligerency of the Cuban rebels. President Cleveland saw fit to ignore this resolution, and the problem of handling the question in a manner satisfactory to our people was left to President McKinley. In May, 1897, Congress voted an appropriation of $50,000 to be immediately applied to the relief of the starving Cubans.

Late in 1897 Weyler was recalled as Governor-General of Cuba, and General Blanco, a more humane man, took his place. But affairs went from bad to worse in Cuba, Spaniards openly abused Americans, and the life of Consul-General Lee at Havana was frequently threatened. On February 15, 1898, the United States battleship *Maine*, then at anchor in Havana Harbor, was sunk by a submarine torpedo, and 266 of her officers and men were killed. In a few hours after receipt of the fearful news in this country indignation was at fever heat, and war was seen to be inevitable.

March 9, Congress placed $50,000,000 in the hands of the President, to be spent at his discretion for the national defence. Five days later Spain hurled back her defiance by ordering a fleet of cruisers and torpedo boats to sail for the West Indies. Commodore Schley was promptly ordered to

mobilize a flying squadron at Hampton Roads.

April was a month of war fever throughout the nation. Consul-General Lee was recalled from Havana, and on April 11 his report, which contained a startling arraignment of Spanish government in Cuba, was read to Congress. In the early morning hours of April 19, at about the same time when Paul Revere took his famous ride on that same date one hundred and twenty-three years before, the Senate first and the House immediately afterward, passed the historic resolution, insisting that "the people of Cuba are, and of right ought to be, free and independent," and calling upon Spain to withdraw at once from the island. In the event of Spain's refusal, the President was directed to use the land and naval forces of this country to enforce the resolution.

Two days later the Spanish Government handed the United States Minister at Madrid his passport. Three days after that Congress passed a formal declaration of war, announcing that this condition had existed since the 21st.

On April 22, the President proclaimed a blockade of Cuban ports, and sent Admiral Sampson's squadron to carry it into effect. On April 23, a proclamation was issued calling for 125,000 volunteers. Special taxes were levied, and a temporary loan of $100,000,000 was authorized.

Commodore Dewey's fleet of six small war vessels had been mobilizing at Hong Kong for some time. On April 27, Dewey sailed for the Philippine Islands. On the morning of Sunday, May 1, he appeared in Manila Bay, and before noon had sunk, or otherwise destroyed, Admiral Montojo's squadron of ten vessels, killing and wounding more than six hundred Spanish sailors. Dewey's loss was seven men slightly wounded. The hero of Manila Bay was promptly made a Rear-Admiral, and later on a full Admiral.

Cervera's fleet from Spain reached Santiago de Cuba May 19. Admiral Schley, who had been sent in pursuit, quickly bottled up the enemy's fleet in the harbor. Sampson, after a feint at bombardment of San Juan de Porto Rico, joined Schley, and took command of the combined fleet.

There being some danger that Cervera might escape some dark night, Naval Constructor Hobson and seven seamen undertook to sink the collier *Merrimac* across the narrow entrance to Santiago Harbor. This was one of the most heroic feats in American naval history. Owing to the terrific Spanish fire it was impossible to sink the vessel at just the point where it had been planned to do it. Hobson and his men, though unharmed, became prisoners of war, and all attempts to exchange them proved futile for several weeks.

By the latter part of April several thousand of the cream of our regular army troops, and a few regiments of volunteers, were in process of mobilization at Tampa. Thereafter, every day saw the arrival of more troops. June 8 an expeditionary army embarked at Tampa, but was recalled before the end of the day on account of the rumored presence of two formidable Spanish cruisers in Nicholas Channel. On the 14th, the fleet, consisting of more than thirty-five troopships and supply ships, and guarded by several war vessels, sailed from Tampa. The total strength of the land forces of this expedition was nearly sixteen thousand officers and men. June 22, the expedition landed at Daiquiri, Cuba, and two days later the first decisive action was fought, which resulted in driving the Spaniards back from Las Guasimas toward Santiago. On July 1, the outer works of Santiago, at El Caney and San Juan Hill, were carried after brilliant fights that won the warmest commendation of the European military experts present. On July 2 there was more desperate fighting, that made the fall of Santiago seem certain.

July 3, Cervera, between the two fires of our army and navy, was ordered to force his way out of the harbor. In the fight that followed he lost his fleet. Admiral Schley, who was second in command of the American fleet, had the actual conduct on our side, though Admiral Sampson, who had gone up the coast for a conference with General Shafter, returned as soon as he heard the opening shots of the fight.

After that, General Shafter pressed the enemy for immediate surrender. On July 14, the capitulation of Santiago was agreed to, though our formal occupation of the city did not take place until three days later. The losses were about 1,500 men killed and wounded on either side.

The best strategic work of the war was that done by General Miles, who was sent in the latter part of July to invade Porto Rico. While he was still marching against the capital, San Juan, a peace protocol was signed, at the request of Spain, on August 12.

Since May, troops had been moving from San Francisco to assist Admiral Dewey in

the capture of Manila. On August 13, before news of the protocol had arrived, our land forces, under General Wesley Merritt, moved upon the city during a furious bombardment by Dewey's fleet. The disheartened Spaniards surrendered after a mere show of resistance.

December 10, 1898, the Peace Treaty between the two countries was signed at Paris. The freedom of Cuba was acknowledged by Spain; Porto Rico, the Philippines, and the island of Guam were ceded to us, and this country agreed to pay to Spain $20,000,000 for the public buildings in the Philippines.

July 6, 1898, Congress passed a joint resolution annexing the Hawaiian Islands at the request of the inhabitants thereof. Tutuila, one of the Samoan Islands, was acquired by this country through arrangement with Great Britain and Germany in 1899. Wake Island, a barren rock on the route between Hawaii and Hong Kong, was annexed by the United States in the same year. This latter island was of value only as a location for a possible cable station.

On April 11, 1899, Congress passed a bill providing for Porto Rico a territorial government differing in many essential respects from that given to any territorial government within the continental limits. Supreme authority was vested in a Governor, to be assisted by an Executive Council, both to be appointed by the President; a House of Delegates, to be elected by the Porto Ricans, and a Supreme Court, to be appointed by the President, was provided for. It was also enacted that goods imported from the United States into Porto Rico should pay a duty of fifteen per cent of the duties prevailing at United States ports, and that the same should be charged on goods shipped in the opposite direction. But it was provided that these tariff charges should remain in force only up to March 1, 1902, with the further proviso that these tariffs should be discontinued in case local taxation became before then sufficient for the costs of the Porto Rican insular government. In the spring of 1900 a bill was passed by Congress returning to Porto Rico nearly $2,000,000 previously collected on imports from that island.

It was in the Philippines that our greatest difficulties, arising out of the changed condition brought about by the war with Spain, came to the surface. February 4, 1899, just before the Senate ratified the treaty of peace with Spain, the Filipinos, under the leadership of Aguinaldo, Luna, and other native chiefs, attacked the American lines around Manila. The insurgents lost about two thousand men, and were driven further back from the city. Aguinaldo became dictator of the rebellious faction of the natives. During the following summer Luna was assassinated by an officer of Aguinaldo's body-guard, and, as many believed, by the order of Aguinaldo. Throughout the spring and summer there was much spirited fighting by our regular and volunteer troops, though at about this time the various organizations of State volunteers were sent home in the order in which they had reached the islands. Regulars replaced them, and the campaign was vigorously pushed. By the fall of 1899 all semblance of organized insurgent resistance had been dissipated. From then on, until March, 1901, Aguinaldo continued to be an elusive fugitive. One after another the little brown leaders surrendered their commands, but the chief cause of the trouble remained free and annoying. Then Brigadier-General Frederick Funston, a volunteer officer from Kansas, contrived a ruse by which he caused himself and some brother officers to be led into the presence of Aguinaldo by a body of native troops enlisted in the United States service from the Macabebe tribe. As soon as he found himself in the presence of the putative Filipino leader, Funston gave the order that resulted in the capture of the Malay dictator. Aguinaldo was brought to Manila, where he took the oath of allegiance to the United States. Funston was made a Brigadier-General in the United States regular army as a reward for his signal service to the country.

Following the capture of Aguinaldo, many other Filipino leaders surrendered and the insurrection fizzled out.

In the fall of 1900 another Presidential contest was fought out along the lines of that of 1896. President McKinley was renominated by the Republican party, with Theodore Roosevelt of New York as his running mate. William J. Bryan was again selected as the standard-bearer of the Democratic party, with Adlai E. Stevenson as the Vice-Presidential candidate. The Republican party was returned to power by a great majority of the popular vote.

May 1, 1901, saw the opening of the great Pan-American Fair at Buffalo. In many respects this Exposition eclipsed the great World's Fair at Chicago in 1893. The object of the Pan-American was to present in bewildering array all the resources of the American Continent, and to

bring the countries thereof into closer commercial union.

A few months before this the world witnessed the most extraordinary military spectacle known to history. In the spring of 1900 China stood behind the blood-red curtain of war against the entire civilized world. For many months previous there had been threats of rebellion against the imperial government of China. The rebels belonged to a secret sect known as the "Boxers."

As to whether the "Boxers" acted in opposition to, or in accordance with, the real wishes of the Chinese Government may never be known to outsiders. But the legations of the various powers represented at Peking were besieged. Baron von Ketteler, the German Ambassador, was murdered, and the same fate befell an official of the Japanese legation. At about this time marines of the various powers were landed and hurried to the capital of China. Admiral Seymour, with a mixed force of two thousand men, including many American marines, tried to reach Peking, but was obliged to turn back. In July, after a powerful international force had been landed in China, a bloody engagement was fought between the allies and the Chinese, who were now composed of "Boxers" and the regular troops of the Empire. After a stubborn fight the Chinese were defeated, though a month more was consumed by the allies in reaching Peking, which was captured August 14.

In the succeeding months many punitive expeditions were undertaken by the allied armies, but from these the United States forces held aloof. No section of Peking was so well governed as that which fell to the rule of the United States troops as represented by the Ninth Infantry. In May, 1901, all United States troops, except a small legation guard under command of Major Robertson, were ordered back to Manila. This was due to the belief of our Government that we had no right to occupy any portion of Chinese soil a moment longer than was necessary for the protection of our citizens and commercial interests. Yet the Chinese in the section of Peking that was temporarily under the administration of our provost guard remonstrated against the withdrawal of our troops. A petition signed by five thousand Chinese of wealth, position, and cultivation declared that under American rule they had enjoyed the best and fairest government known in their history—a magnificent tribute to American capacity to govern wisely and justly!

While holding a reception in the Temple of Music of the Pan-American Exposition, September 6, President McKinley was twice shot by an anarchist, Leon Czolgoz. The President died at a private house in Buffalo, September 14, and on the same day Vice-President Roosevelt took the oath of office as President, pledging himself to carry out the policy of his predecessor. The assassin was executed on October 29. After impressive funeral ceremonies in the Capitol at Washington, September 19, the remains of the President were temporarily interred at Canton, Ohio. Unusual honors were paid his memory in Europe, these including services in Westminster Abbey.

The Hay-Pauncefote Treaty, regarding the projected Isthmian Canal, signed February 5, 1900, and subsequently amended by the Senate, was signed by the President November 18. On June 28, 1902, Congress passed an act to provide for a canal connecting the Atlantic and Pacific, authorizing the President to acquire at a cost not exceeding $40,000,000 all the rights, etc., of the New Panama Canal Company of France, also perpetual control of a strip of land extending from ocean to ocean, with the right to dispose of the waters thereof, and to cause the construction of a ship canal. Failing in this, he was authorized to obtain from Costa Rica and Nicaragua perpetual control of territory for the construction and maintenance of a canal by the Nicaragua route. After concluding a contract with the Panama Canal Company, Secretary Hay began negotiations with Colombia, and on May 18 a treaty was concluded, but questions of sovereignty and jurisdiction were left unsettled, and negotiations were delayed by the civil war in Colombia and the opposition in that country to the relinquishment of sovereignty and the small amount offered by the United States. The treaty was rejected by Colombia, August 17, 1903.

On May 15, 1902, the anthracite coal miners of Pennsylvania began a strike, having failed in their demands for a shorter work day, a minimum day wage-scale, uniform increase of wages, and the weighing of coal for payments by the amounts mined. About 145,000 miners went out. Rioting occurred, with persecution of non-union men, and some destruction of property. On July 30, the State troops were called out, and on September 23-24 President Roosevelt intervened. October 1, a conference

of railroad presidents and labor leaders was held at the White House, but nothing was effected. On October 13, the mine operators agreed to submit the matters under dispute to the arbitration of a commission appointed by the President. On October 21, the miners voted in favor of the plan and declared the strike off. Cessation of work for five months caused a "coal famine," with attendant suffering among the poor and enormous detriment to business. The commission began its work in Washington, October 24, Judge Gray of the United States Circuit Court being chairman, and continued its sessions until February 13, 1903. The result was that the miners secured a sliding wage scale, shorter hours, and an increase in size of mine car or tipping, to be accompanied by proportionate increase in rate paid per car. Both sides agreed to abide by the decision.

The visit of Prince Henry of Prussia (February 23—March 11) was productive of much international good feeling. He was present at the launching of the Emperor's yacht, the *Meteor*, at Shooters Island, New York Bay, Miss Alice Roosevelt naming the vessel; was given the freedom of the city of New York, was most cordially received in Washington and elsewhere in the country, of which he made a tour, and left bearing the title of LL.D., conferred by Harvard University. After his return, Emperor William presented the people of the United States with a bronze statue of Frederick the Great to be erected in Washington.

Early in the year charges against the military administration in the Philippines were made: namely, that officers had tortured Filipinos, burned their dwellings, and committed other barbarities. The President ordered a full investigation, and a court-martial was held in Manila in April, at which General Jacob H. Smith admitted that he had given directions to kill, burn, and lay waste Samar, but claimed that he had not transgressed the laws of retaliation recognized by international law. The court sentenced him to be admonished, and President Roosevelt retired him from active service with a reprimand. On July 4, civil government was established in the Philippines and amnesty to all political prisoners was proclaimed. The cost of the operations in the Philippines up to June was $170,326,586.

On October 14, The Hague tribunal rendered its first decision—in favor of the United States—in the matter of the "Pious Fund," created in 1697 for the support of missions in California. Mexico for a number of years had refused to contribute from this fund to the Roman Catholic bishops in California, holding that the Mexican Church alone should profit by it. On November 29, The Hague tribunal rendered another award in favor of the United States, in the matter of the claim against Russia for the seizure of American vessels by Russian warships in Behring Sea in 1891.

On November 8 was signed the reciprocity treaty, arranged in September by Sir Robert Bond, Premier of Newfoundland, and Secretary Hay. This gives free admission into the United States of fishery products (fresh cod excepted) and crude minerals in return for certain privileges in the way of bait to American fishing vessels in the waters of Newfoundland.

On January 19, 1903, messages were transmitted by wireless telegraphy from the Marconi station on Cape Cod to Cornwall, England, President Roosevelt and King Edward exchanging greetings. The submarine cable between the United States and the Philippines was so far advanced on July 4 that the President sent a message to Honolulu on that date. The cable was completed to Manila not long afterward.

OPERATION OF THE UNITED STATES GOVERNMENT

AS PRESCRIBED by the Constitution, and as defined by subsequent laws and practices, the Government of the United States is the same, as far as outward form is concerned. That the changing conditions of life and civilization on this continent since 1789 have involved numerous departures from the plans originally contemplated can not be denied.

Most notable among these is the difference between prescribed theory and actual practice in the matter of electing the President and Vice-President. These Federal officers are still chosen, formally, by the Electoral College, which consists of members appointed from each State to the number of Senators and Representatives allowed. Although, in the contemplation of the Constitution, all these electors shall be free to choose their own candidates, quite untrammelled by the opinions of their constituents—precisely in the same fashion as Congressmen are privileged to act—the growth and development of parties in this country has determined that each of them is pledged to vote for some certain candidate. Thus, the original object sought in founding the Electoral College is thwarted, and the matter is entirely in the hands of the people, or, rather, of the two or three powerful political parties.

In another respect, also, the present hybrid scheme of choosing a President thwarts the choice of the majority: the electors, like Congressmen, do not represent equal numbers of constituents. Thus, as in the memorable national election of 1876, a Presidential candidate may receive the greater number of popular votes actually cast in the country, and yet fail of the required majority in the Electoral College. Such facts as these have created a strong sentiment in late years for the abolishment of electoral voting in favor of direct popular choice.

CONDUCT AND DEPARTMENTS OF THE GOVERNMENT

NATIONAL CONVENTIONS

THE first step in the process of choosing a President is the appointment of delegates to the national conventions of the several political parties; each party in each State sending four delegates-at-large, and twice as many district delegates as the State has congressional representatives. These party conventions formulate and adopt the platforms for the forthcoming campaign, and nominate the candidates for President and Vice-President.

THE ELECTORAL COLLEGE is made up, as previously stated, of two Electors-at-large,

or Senatorial Electors, and as many District Electors as there are Congressmen from each particular State. Each party in each State chooses its candidates for this body; each district being represented by its own successful candidate, according to the popular vote. The successful electoral candidates in each State meet at their respective State capitals, on the first Monday in January following the general election, and vote for the candidates heading the party tickets with which each member is affiliated. The electoral votes are formally counted, in the presence of the Senate and House of Representatives, on the second Wednesday in February, and the President and Vice-President declared elected. In case of non-election, the matter is placed in the hands of Congress, which chooses candidates by two-thirds vote.

DEPARTMENTS OF THE GOVERNMENT

The Government of the United States consists of three departments: the Executive, the Legislative, and the Judiciary. The Executive is represented by the President; the Legislative, or law-making power, by the two Houses of Congress; the Judiciary, by the United States Supreme Court and the numerous Federal District Courts throughout the Union.

The President is chosen for a term of four years, and may not be removed, except by impeachment for bribery, treason, or other high misdemeanors, after trial before the Senate. In case of his death, resignation, disability, or removal, the law provides that the Vice-President shall succeed to his office and duties. In case of the removal, resignation, or inability of both President and Vice-President, the succession is as follows:

"In case of the removal, death, resignation or inability of both the President or Vice-President, then the Secretary of State shall act as President until the disability of the President or Vice-President is removed or a President is elected. If there be no Secretary of State, then the Secretary of the Treasury will act; and the remainder of the order of succession is: The Secretary of War, Attorney-General, Postmaster-General, Secretary of the Navy, and Secretary of the Interior. The acting President must, upon taking office, convene Congress, if not at the time in session, in extraordinary session, giving twenty days' notice. This act applies only to such Cabinet officers as shall have been appointed by the advice and consent of the Senate, and are eligible under the Constitution to the Presidency."

The Powers of the President are in no sense legislative. He has no authority to propose or issue laws, except such as are passed and ratified by both Houses of Congress. He may, however, recommend desirable legislation in his annual message, and, provided he is in harmony with Congress, his recommendations are usually acted on. He possesses also the power of veto, which enables him to kill any bill passed by Congress, unless, after due reconsideration, it is again passed by a two-thirds vote of both Houses. All bills passed by Congress, except those previously vetoed by the President, and those not returned by him within ten days after submission, must receive his signature, in order to become laws.

Beyond these limits, he has no power to influence legislation, except that he may convene extraordinary sessions of Congress in special emergencies. He may appoint all Federal officers, not chosen by popular election, with the advice and approval of the Senate, and may remove incompetent and dishonest officials in the same class.

In the making of treaties with foreign powers, he acts solely with the two-thirds majority of the Senate, but he has the power to direct the movements of Army and Navy, as Commander-in-Chief, with the advice of his Cabinet and staff, in times of war and peace. He has also the power to pardon criminals convicted of offences against Federal laws, except such as have been duly impeached from office.

The Cabinet, or advisory council of the President, consists of the heads of nine Federal Departments, who are called Secretaries. These Departments are: Of State, War, the Navy, the Treasury, the Interior, Agriculture, the Post-Office, Commerce, and Justice. The head of the Post-Office Department is known as the Postmaster-General, and the head of the Judiciary Department, as the Attorney-General.

All these officers are appointed by the President with the approval of the Senate, and hold office during the Presidential term, subject only to resignation or removal for cause by the President. They are responsible only to him, and have no relations with Congress. Each administers the affairs of his particular department, without reference to the others, except in extraor-

dinary matters that come before the President and Cabinet.

THE LEGISLATIVE DEPARTMNET

The Senate and House of Representatives compose the Legislative Department of the Government.

THE SENATE consists of two members from each State, chosen by the Legislature to represent the State as a whole, like delegates-at-large in the party national conventions, or electors-at-large in the Electoral College.

Each Senator is elected for six years, although the terms are so arranged that one-third of the body retires every three years. A Senator must have been a citizen of the United States for nine years before election, must be at least thirty years of age, and a legal resident of the State he represents.

THE HOUSE OF REPRESENTATIVES is composed of members elected by popular vote from the various States, one member for each 154,325 inhabitants; although every State is entitled to at least one representative. To be eligible as a representative in Congress, one must be at least twenty-five years of age, a citizen of the United States for at least seven years before election, and a legal resident of the Congressional District he represents.

ELECTIONS TO MEMBERSHIP.—Both Houses of Congress have the right to pass on the qualifications of new members, although these are elected under the supervision of the laws and authorities in the several States. Although each new member must present his certificate of election signed by the Governor of his State, there have been very many cases of contested election—the majority, of course, being in the House of Representatives. In such cases, the papers relating to the claims of the contestant are delivered to the Clerk of the House, who refers them to the Committee on Elections. Meantime, the person holdin the Governor's certificate is not allowed to assume his seat. In numerous instances the papers in the case have been so voluminous that the Committee has been obliged to delay decision for several weeks.

COMPULSORY ATTENDANCE.—Both Houses of Congress have the power to compel the attendance of members not absent on valid excuse. Were this not the case, it would frequently be impossible to obtain a quorum for the transaction of business. In the House of Representatives, the Sergeant-at-Arms is furnished with a list of absentees, and directed to find and take them into custody—the order of arrest being necessarily discharged before the members so brought in are allowed to vote. In the Senate, the Sergeant-at-Arms may be directed by the majority of members present to request, and, if necessary, compel, the attendance of absentees.

In the Senate, voting is always by "yeas" and "nays," and in the House, by ballot, except in reconsidering vetoed bills, or when the decision on a ballot is questioned.

THE ORGANIZATION OF BOTH HOUSES is permanent. The Vice-President is presiding officer of the Senate, or, in case of his death, resignation, or accession to the Presidency, some Senator is elected by the members to hold the office.

The House of Representatives elects one of its own members to preside, under the title of Speaker. The members of both Houses are parcelled into various standing committees, which examine into and report on proposed laws and measures, and draw up bills for consideration by the full House. Any bill to become a law must pass both Houses by a majority of votes, but it may be originated, formulated, or amended in either House; but a bill passed in one House and amended in the other must be referred back again for approval and repassage in its revised form. In addition to its legislative office, the Senate also acts as an advisory body to the President in the matter of appointments, treaties, and in some other matters of administrative concern. It is also a high court for impeachment trials.

THE JUDICIARY DEPARTMENT consists of the Supreme Court of the United States and the minor Federal and District Courts throughout the country. Its function is to hear and decide causes at law under the Federal statutes, and also to pass on the constitutionality of acts passed by Congress. In the last particular it has a power superior to either the Executive or Legislative; deciding not only how a law shall be interpreted and enforced, but also whether it shall continue to be a law at all, as it is decided to be in or out of accord with the Constitution. The various Federal courts throughout the Union try cases under the Federal laws, and at no time deal with the laws of the various States, unless there is a direct bearing in particular cases.

PRESIDENTS OF THE UNITED STATES

	Name	Birthplace	Year	Residence	Inaugurated		Politics	Place of Death	Year	Age
					Year	Age				
1	George Washington....	Westmoreland Co., Va...	1732	Virginia.....	1789	57	Fed....	Mt. Vernon, Va.....	1799	67
2	John Adams.....	Quincy, Mass.....	1735	Massachusetts..	1797	62	Fed...	Quincy, Mass.....	1826	91
3	Thomas Jefferson.....	Shadwell, Va.....	1743	Virginia.....	1801	58	Rep...	Monticello, Va.....	1826	83
4	James Madison.....	Port Conway, Va.....	1751	Virginia.....	1809	58	Rep....	Montpelier, Va.....	1836	85
5	James Monroe.....	Westmoreland Co., Va...	1758	Virginia.....	1817	59	Rep....	New York City.....	1831	73
6	John Quincy Adams...	Quincy, Mass.....	1767	Massachusetts..	1825	58	Fed...	Washington, D. C....	1848	81
7	Andrew Jackson.....	Union County, N. C.....	1767	Tennessee.....	1829	62	Dem..	Hermitage, Tenn.....	1845	78
8	Martin Van Buren.....	Kinderhook, N. Y.....	1782	New York.....	1837	55	Dem..	Lindenwold, N. Y....	1862	80
9	William H. Harrison...	Berkeley, Va.....	1773	Ohio.....	1841	68	Whig.	Washington, D. C...	1841	68
10	John Tyler.....	Greenway, Va.....	1790	Virginia.....	1841	51	Dem..	Richmond, Va.....	1862	72
11	James K. Polk.....	Mecklenburg Co., N. C...	1795	Tennessee.....	1845	50	Dem..	Nashville, Tenn.....	1849	54
12	Zachary Taylor.....	Orange County, Va.....	1784	Louisiana.....	1849	65	Whig.	Washington, D. C....	1850	66
13	Millard Fillmore.....	Summerhill, N. Y.....	1800	New York.....	1850	50	Whig.	Buffalo, N. Y.....	1874	74
14	Franklin Pierce.....	Hillsboro, N. H.....	1804	N. Hampshire..	1853	49	Dem..	Concord, N. H.....	1869	65
15	James Buchanan.....	Cove Gap, Pa.....	1791	Pennsylvania...	1857	66	Dem..	Wheatland, Pa.....	1868	77
16	Abraham Lincoln.....	Larue County, Ky.....	1809	Illinois.....	1861	52	Rep...	Washington, D. C....	1865	56
17	Andrew Johnson.....	Raleigh, N. C.....	1808	Tennessee.....	1865	57	Rep...	Carter's Dep., Tenn...	1875	67
18	Ulysses S. Grant.....	Point Pleasant, O.....	1822	D. C.....	1869	47	Rep...	Mt. McGregor, N. Y.	1885	63
19	Rutherford B. Hayes..	Delaware, O.....	1822	Ohio.....	1877	54	Rep...	Fremont, O.....	1893	70
20	James A. Garfield.....	Cuyahoga County, O.....	1831	Ohio.....	1881	49	Rep...	Long Branch, N. J...	1881	49
21	Chester A. Arthur.....	Fairfield, Vt.....	1830	New York.....	1881	51	Rep...	New York City.....	1886	56
22	Grover Cleveland.....	Caldwell, N. J.....	1837	New York.....	1885	48	Dem..	.....	....	..
23	Benjamin Harrison....	North Bend, O.....	1833	Indiana.....	1889	56	Rep...	Indianapolis, Ind.....	1901	68
24	Grover Cleveland.....	Caldwell, N. J.....	1837	New York.....	1893	56	Dem..	.....	....	..
25	William McKinley.....	Niles, O.....	1843	Ohio.....	1897	54	Rep...	Buffalo, N. Y.....	1901	58
26	Theodore Roosevelt....	New York.....	1858	New York.....	1901	43	Rep...	.....	....	..

VICE-PRESIDENTS OF THE UNITED STATES

	Name	Birthplace	Year	Residence	Qualified	Politics	Place of Death	Year	Age at Death
1	John Adams	Quincy, Mass.	1735	Mass.	1789	Fed.	Quincy, Mass.	1826	91
2	Thomas Jefferson	Shadwell, Va.	1743	Virginia	1797	Rep.	Monticello, Va.	1826	83
3	Aaron Burr	Newark, N. J.	1756	New York	1801	Rep.	Staten Island, N.Y	1836	80
4	George Clinton	Ulster Co., N. Y.	1739	New York	1805	Rep.	Washington, D. C.	1812	73
5	Elbridge Gerry	Marblehead, Mass.	1744	Mass.	1813	Rep.	Washington, D. C.	1814	70
6	Daniel D. Tompkins	Scarsdale, N. Y.	1774	New York	1817	Rep.	Staten Island, N.Y	1825	51
7	John C. Calhoun	Abbeville, S. C.	1782	So. Carolina	1825	Rep.	Washington, D. C.	1850	68
8	Martin Van Buren	Kinderhook, N. Y.	1782	New York	1833	Dem.	Kinderhook, N. Y.	1862	80
9	Richard M. Johnson	Louisville, Ky.	1780	Kentucky	1837	Dem.	Frankfort, Ky.	1850	70
10	John Tyler	Greenway, Va.	1790	Virginia	1841	Dem.	Richmond, Va.	1862	72
11	George M. Dallas	Philadelphia, Pa.	1792	Pennsylva'a	1845	Dem.	Philadelphia, Pa.	1864	72
12	Millard Fillmore	Summer Hill, N.Y.	1800	New York	1849	Whig.	Buffalo, N. Y.	1874	74
13	William R. King	Sampson Co., N.C.	1786	Alabama	1853	Dem.	Dallas County, Ala	1853	67
14	J. C. Breckinridge	Lexington, Ky.	1821	Kentucky	1857	Dem.	Lexington, Ky.	1875	54
15	Hannibal Hamlin	Paris, Me.	1809	Maine	1861	Rep.	Bangor, Me.	1891	81
16	Andrew Johnson	Raleigh, N. C.	1808	Tennessee	1865	Rep.	Carter Co., Tenn.	1875	67
17	Schuyler Colfax	New York City	1823	Indiana	1869	Rep.	Mankato, Minn.	1885	62
18	Henry Wilson	Farmington, N. H.	1812	Mass.	1873	Rep.	Washington, D. C.	1875	63
19	William A. Wheeler	Malone, N. Y.	1819	New York	1877	Rep.	Malone, N. Y.	1887	68
20	Chester A. Arthur	Fairfield, Vt.	1830	New York	1881	Rep.	New York City	1886	56
21	T. A. Hendricks	Muskingum Co., O.	1819	Indiana	1885	Dem.	Indianapolis, Ind.	1885	66
22	Levi P. Morton	Shoreham, Vt.	1824	New York	1889	Rep.	.....	....	..
23	Adlai E. Stevenson	Christian Co., Ky.	1835	Illinois	1893	Dem.	.....	....	..
24	Garret A. Hobart	Long Branch, N.J.	1844	New Jersey	1897	Rep.	Paterson, N. J.	1899	55
25	Theodore Roosevelt	New York, N. Y.	1858	New York	1901	Rep.	.....	....	..

JUSTICES OF THE UNITED STATES SUPREME COURT

(NAMES OF THE CHIEF-JUSTICES IN ITALICS.)

Name	Term	Born	Died	Name	Term	Born	Died
John Jay, N. Y.	1789-1795	1745	1829	Samuel Nelson, N. Y.	1845-1872	1792	1873
John Rutledge, S. C.	1789-1791	1739	1800	Levi Woodbury, N. H.	1845-1851	1789	1851
William Cushing, Mass.	1789-1810	1733	1810	Robert C. Grier, Pa.	1846-1870	1794	1870
James Wilson, Pa.	1789-1798	1742	1798	Benjamin R. Curtis, Mass.	1851-1857	1809	1874
John Blair, Va.	1789-1796	1732	1800	John A. Campbell, Ala.	1853-1861	1811	1889
Robert H. Harrison, Md.	1789-1790	1745	1790	Nathan Clifford, Me.	1858-1881	1803	1881
James Iredell, N. C.	1790-1799	1751	1799	Noah H. Swayne, O.	1861-1881	1804	1884
Thomas Johnson, Md.	1791-1793	1732	1819	Samuel F. Miller, Iowa	1862-1890	1816	1890
William Paterson, N. J.	1793-1806	1745	1806	David Davis, Ill.	1862-1877	1815	1886
John Rutledge, S. C.	1795-1795	1739	1800	Stephen J. Field, Calif.	1863-1897	1816	1897
Samuel Chase, Md.	1796-1811	1741	1811	*Salmon P. Chase*, O.	1864-1873	1808	1873
Oliver Ellsworth, Conn.	1796-1800	1745	1807	William Strong, Pa.	1870-1880	1808	1895
Bushrod Washington, Va.	1798-1829	1762	1829	Joseph P. Bradley, N. J.	1870-1892	1813	1892
Alfred Moore, N. C.	1799-1804	1755	1810	Ward Hunt, N. Y.	1872-1882	1811	1886
John Marshall, Va.	1801-1835	1755	1835	*Morrison R. Waite*, O.	1874-1888	1816	1888
William Johnson, S. C.	1804-1834	1771	1834	John M. Harlan, Ky.	1877-....	1833	....
Brockholdt Livingston, N. Y.	1806-1823	1757	1823	William B. Woods, Ga.	1880-1887	1824	1887
Thomas Todd, Ky.	1807-1826	1765	1826	Stanley Matthews, O.	1881-1889	1824	1889
Joseph Story, Mass.	1811-1845	1779	1845	Horace Gray, Mass.	1881-....	1828	....
Gabriel Duval, Md.	1811-1836	1752	1844	Samuel Blatchford, N. Y.	1882-1893	1820	1893
Smith Thompson, N. Y.	1823-1843	1767	1843	Lucius Q. C. Lamar, Miss.	1888-1893	1825	1893
Robert Trimble, Ky.	1826-1828	1777	1828	*Melville W. Fuller*, Ill.	1888-....	1833	....
John McLean, O.	1829-1861	1785	1861	David J. Brewer, Kan.	1889-....	1837	....
Henry Baldwin, Pa.	1830-1844	1779	1844	Henry B. Brown, Mich.	1890-....	1836	....
James M. Wayne, Ga.	1835-1867	1790	1867	George Shiras, Pa.	1892-....	1832	....
Roger B. Taney, Md.	1836-1864	1777	1864	Howell E. Jackson, Tenn.	1893-1895	1832	1895
Philip P. Barbour, Va.	1836-1841	1783	1841	Edward D. White, La.	1893-....	1845	....
John Catron, Tenn.	1837-1865	1786	1865	Rufus W. Peckham, N. Y.	1895-....	1837	....
John McKinley, Ala.	1837-1852	1780	1852	Joseph McKenna, Calif.	1897-....	1843	....
Peter V. Daniel, Va.	1841-1860	1785	1860	Oliver W. Holmes, Mass.	1902-....	1841	....

HISTORICAL AND STATISTICAL TABLE OF THE UNITED STATES AND TERRITORIES

SHOWING THE AREA OF EACH IN SQUARE MILES, AND THE DATE OF ADMISSION OF NEW STATES INTO THE UNION, AND THE DATES OF ORGANIZATION OF TERRITORIES STILL REMAINING

From the Report of the Commissioner of the General Land Office with Corrections. The areas are from the Census Report of 1890.

The Thirteen Original States	Ratified the Constitution	Area of the Orig'l States in Sq. Miles
New Hampshire	June 21, 1788	9,005
Massachusetts	Feb. 6, 1788	8,315
Rhode Island	May 29, 1790	1,250
Connecticut	Jan. 9, 1788	4,990
New York	July 26, 1788	49,170
New Jersey	Dec. 18, 1787	7,815
Pennsylvania	Dec. 12, 1787	45,215
Delaware	Dec. 7, 1787	2,050
Maryland	April 28, 1788	12,210
Virginia	June 25, 1788	42,450
North Carolina	Nov. 21, 1789	52,250
South Carolina	May 23, 1788	30,570
Georgia	Jan. 2, 1788	59,475

States	When Admitted	Sq. Miles
Kentucky	June 1, 1792	40,400
Vermont	March 4, 1791	9,565
Tennessee	June 1, 1796	42,050
Ohio	Nov. 29, 1802	41,060
Louisiana	April 30, 1812	48,720
Indiana	Dec. 11, 1816	36,350
Mississippi	Dec. 10, 1817	46,810
Illinois	Dec. 3, 1818	56,650
Alabama	Dec. 14, 1819	52,250
Maine	March 15, 1820	33,040
Missouri	Aug. 10, 1821	69,415
Arkansas	June 15, 1836	53,850
Michigan	Jan. 26, 1837	58,915
Florida	March 3, 1845	58,680

States	When Admitted	Sq. Miles
Iowa	Dec. 28, 1846	56,025
Texas	Dec. 29, 1845	265,780
Wisconsin	May, 29, 1848	56,040
California	Sept. 9, 1850	158,360
Minnesota	May, 11, 1858	83,365
Oregon	Feb. 14, 1859	96,030
Kansas	Jan. 29, 1861	82,080
West Virginia	June 19, 1863	24,780
Nevada	Oct. 31, 1864	110,700
Nebraska	March 1, 1867	76,855
Colorado	Aug. 1, 1876	103,925
North Dakota	Nov. 3, 1889	70,195
South Dakota	Nov. 3, 1889	76,850
Montana	Nov. 8, 1889	145,310
Washington	Nov. 11, 1889	66,880
Idaho	July 3, 1890	84,290
Wyoming	July 11, 1890	97,576
Utah	Jan. 4, 1896	84,928

Territories	Organized
New Mexico	Sept. 9, 1850
Arizona	Feb. 24, 1863
Indian	June 30, 1834
District of Columbia	July 16, 1790 / Mar. 3, 1791
Alaska	July 27, 1868
Oklahoma	May 2, 1890
Hawaii	July 6, 1898
Porto Rico	April 11, 1899
Philippine Islands	July 4, 1902

OPERATION OF THE ENGLISH GOVERNMENT

THE government of England presents several anomalies to the casual student: it is a monarchy in form, but a republic in practice; it is conducted with reference to no one formal organic document, like the Constitution of the United States, yet the principles of popular and personal rights, supposedly to be secured by such an instrument, are jealously and effectively conserved; it retains the ancient tradition of allowing a hereditary aristocracy, represented in the Upper House of Parliament, to censor all laws passed in the House of Commons, yet, in effect, the popular representatives are able to achieve such legislation as seems desirable; it maintains an established church, supported by taxation and public appropriations, with its bishops seated in the House of Lords, yet in no country on earth is religious liberty more secure.

THE ADMINISTRATION OF THE GOVERNMENT

THE FUNDAMENTAL LAW

THE Constitution of England is found in the large body of carefully preserved precedents and in the five great historic documents that define the first principles of English liberty. The first and most notable of these is the *Magna Charta*, signed by King John in 1215, which grants (1) the first principles of representative government, in the formation of Parliament in two houses, which shall pass upon all questions of taxation and the making or repealing of general laws; (2) the right of each man to a fair trial by a competent court before sentence of imprisonment, death, or forfeiture of property is imposed; (3) trial by jury; (4) the sanctity of justice, against delay or purchase. These principles were precisely stated under sixty-three heads, most of which have appeared in the Common Law, developed in later times.

The second great document is the *Petition of Right*, formulated in 1628, which sets forth the protest of Parliament against sundry abrogations of personal rights that had been practiced during the centuries succeeding the reign of Edward III.

The third document is the *Habeas Corpus Act*, dating from the reign of Charles II (1679), which still further contributed to safeguarding the liberties of English subjects by providing the right of habeas corpus, and a fair and adequate trial on all charges made against a suspected criminal.

As the fourth document we have the *Bill of Rights*, granted by William and Mary in 1689, which dealt particularly with religious liberties, enacting certain principles looking toward the preservation of Protestantism and the maintenance on the throne of rulers of the reformed faith. To this end, many of the principles of representa-

tive government were reaffirmed more definitely and precisely.

The fifth document, the *Act of Settlement*, formulated on the accession of William III in 1701, fixes the line of succession to the throne with the Electress Sophia of Hanover and her heirs, as the nearest Protestant descendants of the Stuarts. In attempting to still more firmly establish the liberties of the English people against the assumptions of the Sovereigns, it enacts that (1) no foreigner shall sit in Parliament nor hold office under the Crown; (2) that the King shall not go to war in defence of foreign countries without the permission of Parliament; (3) that the King shall not pardon any official, so that Parliament shall be unable to impeach him.

These five documents, while not in the precise form of a Constitution, are really sufficiently extensive, explicit and far-reaching in their provisions to serve precisely the same end. Furthermore, so far as the people of England are concerned, they have operated eminently well to the preservation of liberties and the restraint of tyranny and injustice in the Sovereign and his ministers.

THE SOVEREIGN

According to the provisions of the Act of Settlement, the Sovereign of the British Empire, ruling under the title of King of Great Britain and Ireland and Emperor of India, shall be a direct descendant by the eldest line of the Princess Sophia of Hanover, a Protestant in faith, a member of the Established Church of England, and married only to a Protestant. On account of the numerous limitations of power imposed by the various constitutional acts already mentioned, and by the customary disuse of other rights and privileges, such as the veto power, the King or Queen of Great Britain is to a large extent a figurehead. His proper sovereign powers are largely delegated to his ministers, and exercised only with the sanction of Parliament.

Although, according to all principles and precedents, he has the sole power to summon, prorogue, or dissolve Parliament, even this right is very largely exercised with the advice and on the responsibility of his ministers. He is required, however, to deliver an address at the opening of Parliament, which must be read by himself or some appointed substitute. Precedent requires also that he shall sign all bills passed before they can become laws, but, as a general rule, the suggestions of the ministry are sufficient to secure the required assent.

Among the powers still exercised freely by the Sovereign, although largely in consultation with the ministry, is the right to appoint all officers of the Army and Navy, and all bishops and other dignitaries of the Church of England, and the right of pardoning criminals. The Sovereign may not be removed from office for any cause, and the ministers are responsible for his personal conduct in all respects.

THE PRIME MINISTER

The really active and responsible head of the English Government is the Prime Minister, who, as the recognized leader of his party in the House of Commons, succeeds to the office on the downfall of the opposing forces, through failure of their policy. Thus, while the people do not vote directly for the Prime Minister or any other executive officer, popular sentiment, expressed in their suffrage, really determines who shall succeed to the office. The Sovereign, recognizing the choice of the people, appoints the recognized leader of the successful party as his Prime Minister.

THE CABINET

The Prime Minister succeeds to office along with a number of other ministers, or secretaries, who, with himself, are nominated and recommended by the dominant party from both Houses of Parliament, and confirmed by the Sovereign.

The Cabinet is, in fact, a direct evolution of the Privy Council, which has been recognized as the body of advisers to the Sovereign, often to the detriment of popular liberties, since the reign of Henry VI. The Privy Council was always a rather loose and indefinite body, consisting of members of the Royal Family, the high dignitaries of the Church, certain lords and exalted officials, and persons appointed to the title of Privy Councillor by the favor of the Sovereign. The entire body seldom met, and no member ever attended unless specially summoned. Since the organization of the Cabinet in the seventeenth century, as a special committee of the Privy Council, practically all its functions have been taken over, and the body has not met since 1839.

The Cabinet, as at present constituted, consists of seventeen members designated as follows:

1. Prime Minister and First Lord of the Treasury.
2. Lord High Chancellor.
3. Lord President of the Council.
4. Chancellor of the Exchequer.
5. Secretary of the Home Department.
6. Secretary of State for War.
7. Secretary of State for Foreign Affairs.
8. Secretary of State for the Colonies.
9. Secretary of State for India.
10. First Lord of the Admiralty.
11. Lord Chancellor of Ireland.
12. Chief Secretary of the Lord-Lieutenant of Ireland.
13. Chancellor of the Duchy of Lancaster.
14. President of the Board of Trade.
15. Lord of the Privy Seal.
16. President of the Local Government Board.
17. President of the Board of Agriculture.

Each of them conducts the affairs of his own Department so long as he is supported by Parliament, but is obliged to resign as soon as his policy fails in securing the approval of that body. Each of them is directly responsible to the House of Commons in the inauguration and conduct of any lines of policy that may be adopted, and continue as leaders of their party in the House only so long as their measures are successful.

Although the Sovereign has not sat at meetings of the Cabinet since the reign of Queen Anne; he is theoretically responsible for all its doings. Practically, however, the responsibility rests in the members themselves, and through them in Parliament, to which they are responsible.

PARLIAMENT

The English Parliament consists of two Houses—the House of Lords and the House of Commons.

Members of the House of Lords are drawn (1) from the peers of the realm, either such as inherit their titles or such as are created by the Sovereign; (2) from the bishops of the Church, who have seats in the House by virtue of their office; (3) from the Irish and Scotch peers; the former elected for life and the latter for the duration of the Parliament.

The presiding officer of the House of Lords is the Lord High Chancellor, and, although the membership is between 500 and 600, a quorum may be constituted with three members including the Presiding Officer.

The functions of this body are to review and revise all laws passed by the House of Commons, except laws relating to public revenue and expenditure, which must be passed or rejected without amendment. Special committees are appointed from among its members to inquire into special matters that can not be referred to the whole House. It also acts as the Supreme Court of Appeal in all causes that are qualified to come before it.

THE HOUSE OF COMMONS

The Lower House of the British Parliament, known as the House of Commons, is composed of about 700 members elected by popular ballot from the various districts of England. Each member must be at least twenty-one years of age, and can not be a clergyman, an English or Scottish peer, or the incumbent of any one of several specified local and government offices. The term of office is seven years, although this time is seldom served by any one member after one election, since Parliament is generally dissolved before its expiration, thus necessitating a new election.

The presiding officer, or Speaker, is elected by the majority of the members from among their number. A quorum is constituted by forty members, including this officer.

The House of Commons acts under the direction of the Ministry, subject to the reports of its own select committees, specially appointed to inquire into proposed measures. It may originate and pass any measure of law in concurrence with the House of Lords, but all bills relating to taxation and the granting of supplies must be originated by this body, and can not be revised by the Upper House.

A TABLE OF THE KINGS AND QUEENS OF ENGLAND

Name		Accession	Died	Age	Reigned
	SAXONS AND DANES				
Egbert	First King of all England	827	839	—	12
Ethelwulf	Son of Egbert	837	858	—	19
Ethelbald	Son of Ethelwulf	858	860	—	2
Ethelbert	Second Son of Ethelwulf	858	866	—	8
Ethelred	Third son of Ethelwulf	866	871	—	5
Alfred	Fourth son of Ethelwulf	871	901	52	30
Edward the Elder	Son of Alfred	901	925	46	24
Athelstan	Eldest son of Edward	925	940	—	15
Edmund	Brother of Athelstan	940	946	23	6
Edred	Brother of Edmund	946	955	—	9
Edwy	Son of Edmund	955	958	20	3
Edgar	Second son of Edmund	958	975	31	17
Edward the Martyr	Son of Edgar	975	979	17	4
Ethelred II.	Half-brother of Edward	979	1016	—	37
Edmund Ironside	Eldest son of Ethelred	1016	1016	28	1
Canute	By conquest and election	1017	1035	40	18
Harold I.	Son of Canute	1035	1040	—	5
Hardicanute	Another son of Canute	1040	1042	—	2
Edward the Confessor	Son of Ethelred II.	1042	1066	64	24
Harold II.	Brother-in-law of Edward	1066	1066	—	0
	THE HOUSE OF NORMANDY				
William I.	Obtained the Crown by conquest	1066	1087	60	21
William II.	Third son of William I.	1087	1100	43	13
Henry I.	Youngest son of William I.	1100	1135	67	35
Stephen	Third son of Stephen, Count of Blois, by Adela, fourth daughter of William I.	1135	1154	49	19
	THE HOUSE OF PLANTAGENET				
Henry II.	Son of Geoffrey Plantagenet, by Matilda, only daughter of Henry I.	1154	1189	56	35
Richard I.	Eldest surviving son of Henry II.	1189	1199	42	10
John	Sixth and youngest son of Henry II.	1199	1216	51	17
Henry III.	Eldest son of John	1216	1272	65	56
Edward I.	Eldest son of Henry III.	1272	1307	67	35
Edward II.	Eldest surviving son of Edward I.	1307	1327	43	20
Edward III.	Eldest son of Edward II.	1327	1377	65	50
Richard II.	Son of the Black Prince, eldest son of Edward III.	1377	Dep. 1399	33	22
	THE HOUSE OF LANCASTER				
Henry IV.	Son of John of Gaunt, fourth son of Edward III.	1399	1413	46	14
Henry V.	Eldest son of Henry IV.	1413	1422	34	9
Henry VI.	Only son of Henry V. (Died 1471)	1422	Dep. 1461	49	39
	THE HOUSE OF YORK				
Edward IV.	His grandfather was Richard, son of Edmund, fifth son of Edward III; and his grandmother, Anne, was great-granddaughter of Lionel, third son of Edward III.	1461	1483	41	22
Edward V.	Eldest son of Edward IV.	1483	1483	12	0
Richard III.	Younger brother of Edward IV.	1483	1485	33	2
	THE HOUSE OF TUDOR				
Henry VII.	Son of Edmund, eldest son of Owen Tudor, by Katharine, widow of Henry V; his mother, Margaret Beaufort, was great-granddaughter of John of Gaunt	1485	1509	52	24
Henry VIII.	Only surviving son of Henry VII.	1509	1547	55	38
Edward VI.	Son of Henry VIII by Jane Seymour	1547	1553	16	6
Mary I.	Daughter of Henry VIII by Katherine of Aragon	1553	1558	42	5
Elizabeth	Daughter of Henry VIII by Anne Boleyn	1558	1603	69	45

A TABLE OF THE KINGS AND QUEENS OF ENGLAND—(continued)

Name	THE HOUSE OF STUART	Accession	Died	Age	Reigned
James I.	Son of Mary Queen of Scots, granddaughter of James IV and Margaret, daughter of Henry VII.	1603	1625	58	22
Charles I.	Only surviving son of James I.	1625	1649	48	24
	Commonwealth declared May 19.	1649	—	—	—
Commonwealth	Oliver Cromwell, Lord Protector.	1653	1658	59	—
	Richard Cromwell, Lord Protector.	1658	Res. 1659	—	—
	THE HOUSE OF STUART—*Restored*				
Charles II.	Eldest son of Charles I.	1660	1685	54	25
James II.	Second son of Charles I (died Sept. 16, 1701) (Interregnum, Dec. 11, 1688—Feb. 13, 1689)	1685	Dep. 1688 Dec. 1701	68	3
William III. and Mary II.	Son of William, Prince of Orange, by Mary, daughter of Charles I. / Eldest daughter of James II.	1689	1702 / 1694	51 / 32	13 / 6
Anne.	Second daughter of James II.	1702	1714	49	12
	THE HOUSE OF HANOVER				
George I.	Son of Elector of Hanover, by Sophia, daughter of Elizabeth, daughter of James I.	1714	1727	67	1
George II.	Only son of George I.	1727	1760	77	33
George III.	Grandson of George II.	1760	1820	82	60
George IV.	Eldest son of George III.	1820	1830	68	10
William IV.	Third son of George III.	1830	1837	72	7
Victoria	Daughter of Edward, fourth son of George III.	1837	1901	82	64
Edward VII.	Eldest son of Victoria.	1901			

SOVEREIGNS OF SCOTLAND FROM A.D. 1057 TO THE UNION OF THE CROWNS

Names	Began to Reign	Names	Began to Reign
Malcolm (*Ceanmohr*)	1057, Apr.	Roberf II (Stuart)	1371, Feb. 22
Donald (*Bane*)	1092, Nov.	Robert III	1390, Apr. 12
Duncan	1094, May	James I	1406, Apr. 4
Donald (*Bane*) restored	1095, Nov.	James II	1437, Feb. 20
Edgar	1097, Sept.	James III	1460, Aug. 3
Alexander I	1107, Jan. 8	James IV	1488, June 11
David I	1124, Apr. 27	James V	1513, Sept. 9
Malcolm (*Maiden*)	1153, May 24	Mary	1542, Dec. 16
William (*The Lion*)	1165, Dec. 9	Francis and Mary	1558, Apr. 24
Alexander II	1214, Dec. 4	Mary	1560, Dec. 5
Alexander III	1249, July 8	Henry and Mary	1565, July 29
Margaret	1286, Mar. 19	Mary	1567, Feb. 10
John (Balliol)	1292, Nov. 17	James VI.	1567, July 29
Robert I (Bruce)	1306, Mar. 27	(Ascended the throne of England as James I., March 24, 1603.)	
David II	1329, June 7		

WELSH SOVEREIGNS OR PRINCES—A.D. 840 TO 1282

Roderic the Great	840	Bleddyn	1063
Anarawd, son of Roderic	877	Trahaern ap Caradoc	1073
Howel Dha, the Good	943	Griffith ap Cynan	1079
Jefan and Jago	948	Owain Gwynedd	1136
Howel ap Jefan, the Bad	972	David ap Owain Gwynedd	1169
Cadwallon, his brother	984	Llewelyn the Great	1194
Meredith ap Owen ap Howel Dha	985	David ap Llewelyn	1240
Idwal ap Meyric ap Edwal Voel	992	Llewelyn ap Griffith, last Prince, 1246; slain	1282
Llewelyn ap Sitsylht	1015	Edward of Carnarvon, afterward King Edward II of England; born	1284
Iago ap Idwal ap Meyric	1023	Created Prince of Wales	1301
Griffith ap Llewelyn ap Sitsylht. Killed	1039		

OPERATION OF THE FRENCH GOVERNMENT

THE present government of France is republican, under the provisions of the Constitution adopted February 25, 1875. Historically speaking, the present order is known as the "Third Republic," and, as such, succeeded to power on the downfall of the "Second Empire" in 1870. After numerous difficulties and continued oppositions from the monarchical parties, the Constitution was finally adopted, and, with a number of emendations and changes made in succeeding years, still continues to be the organic law of France.

The French Constitution relates almost wholly to the nature, powers, and manner of election of government officers; all these points being most elaborately developed, in order to prevent the slightest miscarriage or irregularity that might give opportunity to the persistent opponents of the republican form of government.

In order to revise and amend the Constitution, it is necessary that the Senate and Chamber of Deputies, the two Chambers of the National Legislature, shall meet as one body to deliberate the matter, under the title of the "National Assembly." This body can meet, however, only after the joint vote of both Houses, or Chambers, has declared that revision or emendation is desirable.

THE DEPARTMENTS OF THE GOVERNMENT

THE PRESIDENT

THE President of the French Republic must be a citizen of France and unrelated by birth with any family that has ever occupied the French throne. He is elected for a term of seven years by the National Assembly, which is formed by the two Chambers sitting together for the purpose. Once elected, he can not be removed, unless impeached by the Chamber of Deputies, and tried on the charge of high treason before the Senate. In case of his death, removal, or resignation, executive duties are discharged by the Council of Ministers, or Cabinet, until the National Assembly has elected a successor.

The duties and capacities of the French President include supreme command of the Army and Navy of the Republic; the making of appointments and removals, each such act, however, requiring the countersignature of the Minister whose Depart-

ment is concerned; the making of treaties, alliances, and commercial agreements, and the granting of pardons. He must also sign all bills passed by the Chambers—the counter-signature of one of the Ministers being required in every case—but, instead of the veto power possessed by the President of the United States, he can only demand reconsideration of any measure by the Chambers.

The President has power to adjourn the sessions of the Chambers at any time for not more than one month. He can also call extraordinary sessions, when occasion demands, and order extra sessions at his discretion. After the regular session of the Chambers has lasted five months, he can close it, and, with the consent of the Senate, can dissolve the Deputies at any time; thus necessitating a new election, which he can direct at discretion. He can not dissolve the Senate, however, his action in regard to the Deputies merely closing the Senatorial session, without terminating its life. He may suggest legislation in a message read at the opening of the Chambers by one of the Ministers.

According to the wording of the Constitution, "The President of the Republic has the initiative of the laws, concurrently with the members of the two Chambers. He promulgates the laws when they have been voted by the two Chambers: he looks after and sees to their execution. He has the right of pardon; amnesty can be granted by law only. He disposes of the armed force. He appoints to all civil and military positions. He presides over national festivals; envoys and ambassadors of foreign powers are accredited to him. Every act of the President of the Republic must be countersigned by a Minister."

THE COUNCIL OF MINISTERS

The Cabinet or Council of Ministers forms the second department of the Executive, sharing with the President in the administration of the laws and public affairs of the Nation. It has eleven members chosen by the President, generally from the Chambers, and these, as members of the Cabinet, are recognized as leaders in the Chambers with special privileges in debate; as members of the Council of Ministers, they conduct the affairs falling in the jurisdiction of their several departments. According to precedent, the President may appear in the Chambers, although since the administration of President Thiers, who took active part in the debates on restoring the monarchy, the Ministers alone have represented the Executive in the legislative body.

The members of the Council preside over the following departments:

1. Department of War.
2. Department of Foreign Affairs.
3. Department of Finance.
4. Department of Public Instruction.
5. Department of Justice and Public Worship.
6. Department of Marine and the Colonies.
7. Department of Public Works.
8. Department of Agriculture.
9. Department of Commerce.
10. Department of the Interior.
11. Department of Posts and Telegraphs.

The President has a seat in all the meetings of the Council of Ministers, shaping and directing the policy of administration; although the Ministers are not responsible to him, but "jointly and severally to the Chambers for the policy of the Government, and individually for their personal acts." If the policy of the Ministers is not sustained by the Chambers, their resignations must be submitted.

In addition to the Cabinet, the President appoints the Council of State, composed of Councillors, Masters of Requests, and Auditors, and presided over by the Minister of Justice. Its members "may be dismissed only by decree rendered in the Council of Ministers." This latter body has the duty of advising on all matters of law, administrative by-laws, and regulations, submitted either by the Chambers or the Executive, and its decision is final in all disputes on these points.

THE CHAMBERS

The two Chambers are the Senate and the Chamber of Deputies.

According to the provisions of the Constitution, "the Senate consists of 300 members; 225 elected by the Departments and Colonies and 75 elected by the National Assembly.

"No one can be Senator unless he is a French citizen, forty years of age at least, and enjoying civil and political rights."

The term of office is nine years, but the rotation is so arranged that one-third of the members shall retire every three years.

The business of the Senate is largely in the hands of *Bureaux*, which are chosen

monthly by lot to appoint all special committees on bills and measures, except such as are directly elected by the full membership for special purposes.

The Senate also chooses its own presiding officer, known as the President, and its Vice-Presidents and other officers. Its quorum is a majority of members. Its duties are to originate all legislative measures, except bills relating to revenue, appropriations, etc., in which the Chamber of Deputies must take the initiative, and in reviewing and amending all acts passed by the Deputies.

THE CHAMBER OF DEPUTIES

Members of the Chamber of Deputies are elected from each Department of France, and from several of the Colonies by popular vote; the regulation specifying one deputy for each 70,000 inhabitants. The term of office is four years.

To be eligible to this body the sole requirements are that a man shall be a citizen of France and at least twenty-five years of age.

Like the Senate, the Chamber of Deputies chooses its own parliamentary officers, and delegates the business of its special committees to *bureaux,* which are monthly chosen by lot. It may originate and pass, concurrently with the Senate, all bills on public matters, but is required by law to originate all measures relating to finance and appropriations. It may bring charges against the President of the Republic, but only the Senate can act as a court to try him.

FRENCH DYNASTIES AND SOVEREIGNS

The Merovingians

Clovis, "The Hairy," King of the Salic Franks..... 428
Childeric III, last of the race..... 737

The Carlovingians

Pépin, "The Short," son of Charles Martel.. 752
Charlemagne, The Great, Emperor of the West 768
Louis V, "The Indolent," last of the race... 986

The Capets

Hugh Capet, "The Great"..... 987
Louis IX, "St. Louis"..... 1226
Charles IV, "The Handsome"..... 1322

The House of Valois

Philip VI de Valois, "The Fortunate"..... 1328
Henry III, last of the race..... 1574

The House of Bourbon

Henry IV, "The Great," King of Navarre... 1589
Louis XIII, "The Just"..... 1610
Louis XIV, "The Great," Dieudonné 1643
Louis XV, "The Well-beloved"..... 1715
Louis XVI (guillotined January 21, 1793)... 1774
Louis XVII (never reigned)..... 1793

The First Republic

The National Convention first sat...Sept. 21, 1792
The Directory nominated.....Nov. 1, 1795

The Consulate

Bonaparte, Cambacérès, and Lebrun...Dec. 24, 1799
Bonaparte, Consul for 10 years.....May 6, 1802
Bonaparte, Consul for Life.....Aug. 2, 1802

The Empire

Napoleon I decreed Emperor.....May 18, 1804
Napoleon II (never reigned) died....July 22, 1832

The Restoration

Louis XVIII re-entered Paris.....May 3, 1814
Charles X (deposed July 30, 1830, died November 6, 1836)..... 1824
Heir-expectant, Henry, Comte de Chambord Sept. 29, 1820

The House of Orleans

Louis Philippe, King of the French..... 1830
(Abdicated Feb. 24, 1848, died Aug. 26, 1850.)
Heir-apparent, Comte de Paris, born..Aug. 24, 1838

The Second Republic

Provisional Government formed.....Feb. 22, 1848
Louis Napoleon elected President....Dec. 10, 1848

The Second Empire

Napoleon III elected Emperor.....Nov. 22, 1852
(Deposed Sept. 4, 1870, died Jan. 9, 1873.)

The Third Republic

Committee of Public Defence.....Sept. 4, 1870
L. A. Thiers elected President.....Aug. 31, 1871
Marshal MacMahon elected President.May 24, 1873
Jules Grévy elected President.....Jan. 30, 1879
Sadi Carnot elected President.....Dec. 3, 1887
Casimir-Perier elected President.....June 27, 1894
Felix Faure elected President.....Jan. 17, 1895
Emile Loubet elected President.....Feb. 18, 1899

OPERATION OF THE GERMAN GOVERNMENT

ALTHOUGH, previous to the establishment of the modern German Empire in 1871, the various states and cities of Germany had been accustomed for several centuries to send representatives to the general diets and had formed themselves into a Confederation for offensive and defensive purposes, there was no organic unity among them that should constitute an undivided German nation. Each state, as also several of the more important cities, continued to be ruled by its own independent and supreme sovereign. At the end of the Franco-Prussian War, however, the long-contemplated end, of an organic empire, was finally attained, with the King of Prussia as its President, under the title of Emperor (*Kaiser*).

While the Emperor was proclaimed supreme ruler of Germany, under the provisions of the Agreements of Federation formally adopted at Versailles on January 18, 1871, the rulers of the several German states, such as Bavaria, Würtemburg, Baden, Hesse, etc., were still recognized as sovereigns possessed of a considerable measure of independence. In this respect the federation of the German Empire resembles that of the several States of the American Union, whose sovereignty is still affirmed, in spite of the indissolubleness of their alliance. The territory included in the German Empire covers the states of Prussia, Bavaria, Saxony, Würtemburg, Baden, Hesse, Mecklenburg-Schwerin, Saxe-Weimar, Mecklenburg-Strelitz, Oldenburg, Brunswick, Saxe-Meiningen, Saxe-Altenburg, Saxe-Coburg-Gotha, Anhalt, Schwarzburg-Rudolstadt, Schwarzburg-Sonderhausen, Waldeck, Reuss, Schaumburg-Lippe, Lippe, Lubeck, Bremen, Hamburg.

The federal government of all these states and cities is formulated in the Constitution issued by imperial proclamation April 16, 1871. It contains fourteen chapters and seventy-seven articles. Its chapters deal with the following subjects: (1) Territory; (2) Legislation; (3) Federal Council; (4) The Presidium; (5) The Diet; (6) Customs and Commerce; (7) Railways; (8) Mails and Telegraphs; (9) Marine and Navigation; (10) Consular Affairs; (11) Military Affairs; (12) Finances; (13) Settlement of Disputes; (14) General Provision for revising the Constitution.

DEPARTMENTS AND POWERS OF THE GOVERNMENT

THE EMPEROR

THE Chief Magistrate, or President, of the German Empire is the King of Prussia, who holds office for life by virtue of inheritance, under the title of Emperor. He is irresponsible and can not be removed or impeached for any cause whatsoever.

By virtue of his office the Emperor is the federal representative of the Empire, and is empowered to conclude peace, make treaties and other alliances with foreign powers, without reference to the legislative assemblies, except in such matters as concern customs duties, commerce, and imposts, which constitutionally fall under the surveillance of the representatives. The Emperor can also declare war on any foreign power that has made an attack on the coasts or territory of the Empire, but for an offensive war the consent of the Bundesrath is required. He is Commander-in-Chief of the entire military and naval forces of the Empire, and has supreme control over their organization and equipment. He is particularly authorized to maintain the Army at its full strength and to select suitable places for garrisons and fortifications, as well as to control the appointment and transfer of officers, according to his own judgment.

The Emperor has the right to appoint the Chancellor of the Empire and any civil officers. He may also discharge the Chancellor, and, with the counter-signature of that officer, may remove any other official. He has the power to grant pardons; may declare martial law, whenever necessary in his opinion, and may summon, open, adjourn, and close the two Houses of the Legislature, or dissolve the Reichstag, with the advice or consent of the Bundesrath.

In the matter of legislation he has the right of promulgating or giving necessary authority to any bills passed by the two Houses of the Imperial Legislature. While the right of veto is not definitely accorded, he may refrain from promulgating any law, on the ground that it involves a change in the Constitution, unless it has been passed by forty-five out of the total of fifty-eight votes in the Bundesrath.

THE CHANCELLOR

The responsible administrative head of the German Empire is the Chancellor, who is appointed by the Emperor and retained in office at his pleasure solely, not being removable by legislative action. In one aspect his duties closely resemble those of the English Prime Minister, but he does not form a cabinet, and is also presiding officer in the Bundesrath.

The Chancellor must be one of the seventeen Prussian representatives in the Bundesrath, in which he represents the Emperor as King of Prussia. He controls all the departments of the Government through a central bureau; superintends the administration of laws in the various states; and renders an annual budget and an account of the condition of the Empire to the Reichstag.

THE BUNDESRATH

The Upper House of the Imperial German Legislature is known as the Bundesrath, which word is best to be translated Federal Council. This body consists of fifty-eight members from all the States of Germany, apportioned as follows: seventeen members from Prussia, including Hanover, the Electorate of Hesse, Holstein, Nassau, and Frankfort; six from Bavaria; four each from Saxony and Würtemburg; three each from Baden and Hesse; two each from Brunswick and Mecklenburg-Schwerin, and one each from the remaining seventeen States. These members are not elected, but are appointed by the Kings or other rulers in their several States.

In the Reichstag, as in other branches of the Government, the ascendency of Prussia is maintained. The Imperial Chancellor is its chairman, and, at a regular meeting, himself or his accredited representative constitutes a quorum for the transaction of business. In case of a tie in the voting on any question, the decision is given to Prussia, whose representatives are required to cast an undivided vote. The Chancellor votes with the other Prussian representatives.

The business of the Bundesrath is largely divided among seven permanent committees, which are annually appointed by the Council from among its own members; except those on the Army and Navy, whose members are chosen by the Emperor himself, always appointing one Bavarian to the former. No other restrictions as to membership are prescribed, except that each committee must contain representatives of

at least four of the German States. These permanent committees are (1) on the army; (2) on the navy; (3) on duties and taxes; (4) on commerce and trade; (5) on railroads, post-offices, and telegraphs; (6) on the judiciary; (7) on accounts. In addition, there is an annually elected committee on foreign affairs, to be composed of the plenipotentiary representatives of Bavaria, Saxony, and Würtemburg, and of two other States.

The duties of the Bundesrath include the origination of bills to be sent to the Reichstag in the name of the Emperor. The particular departments affected by its deliberations are (1) measures proposed by or to be submitted to the Reichstag; (2) general provisions for the execution of laws thoughout the Empire; (3) measures looking to the remedying of defects in existing laws. By a wise provision, all bills of local application are voted on only by representatives of the interested States.

THE REICHSTAG

The Lower House of the German Imperial Legislature is known as the Reichstag, which is by translation the Imperial Diet. It consists of representatives from every German State, elected by popular suffrage and apportioned at the ratio of one to every 100,000 inhabitants. To be eligible to the Reichstag a candidate must be at least twenty-five years of age, and have resided at least one year in the State he is to represent.

For the transaction of business the members are divided by lot into seven sections, from which select committees are appointed, as required. There are no permanent committees. The president and other officers are elected by the members, and a quorum for business must always be a majority.

The Reichstag has power to originate bills and to pass laws in concurrence with the Bundesrath; a majority of votes being always essential to the passage of a measure. Its concurrence in a number of laws is required by the Constitution, and it may withhold its sanction to such measures by majority vote. It is also allowed to inquire into certain matters of administration, among which are questions of trade, customs, weights and measures, banking, railroads, navigation, postal and telegraph affairs, judicial administration and the execution of sentences, the Army and Navy, the press, trade unions, etc., etc.

DESCRIPTIVE ASTRONOMY

ASTRONOMY (from the Greek, *astron,* a star, and *nomos,* a law) is, comprehensively, that science which explains the nature and motions of the bodies filling infinite space, including our own globe, in its character of a planet or member of the solar system. The science may be divided into two departments—1. *Descriptive Astronomy,* or an account of the systems of bodies occupying space; 2. *Mechanical Astronomy,* or an explanation of the physical laws which have produced and which sustain the arrangements of the heavenly bodies, and of all the various results of the arrangement and relations of these bodies. *Uranography* is a subordinate department of the science, presenting an account of the arrangements which have been made by astronomers for delineating the starry heavens and working the many mathematical problems of which they are the subject.

THE PLANETS, SATELLITES, AND FIXED STARS

THE field contemplated by the astronomer is no less than INFINITE SPACE. So, at least, he may well presume space to be, seeing that every fresh power which he adds to his telescope allows him to penetrate into remoter regions of it, and still there is no end. In this space, systems, consisting of suns and revolving planets, and other systems again, consisting of a numberless series of such lesser systems, are suspended by the influence of gravitation, operating from one to another, yet each body at such a distance from another, as, though the mind of man can in some instances measure, it can in none conceive. We begin with what is usually called the Solar System—that is, the particular solar system to which our earth belongs.

THE SOLAR SYSTEM

The solar system, so named from *sol* (Latin), the sun, consists of the sun in the centre, numerous planets, and an unknown number of bodies named comets. The word planet is from the Greek *planao,* to wander, because the few such bodies known to the ancients were chiefly remarkable in their eyes on account of their constantly shifting their places with reference to the other luminaries of the sky. Comets are so named from *coma* (Latin), a head of hair, because they seem to consist of a bright spot, with a long brush streaming behind.

Some of the planets have other planets moving round them as centres—the moon, for instance, round the earth. These are called secondary planets, moons, or satellites; while those that move round the sun are called primary planets. The primary planets consist: 1st, of eight larger planets, including the earth; their names, in the order of their nearness to the sun, are—Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Herschel or Uranus, and Neptune. 2d. A group of lesser planets, which are generally known as asteroids. These bodies, numbering between 400 and 500, are all very small. The entire surface of one of the larger asteroids may be equal to that of Texas. There are many asteroids whose areas, respectively, do not equal that of Rhode Island.

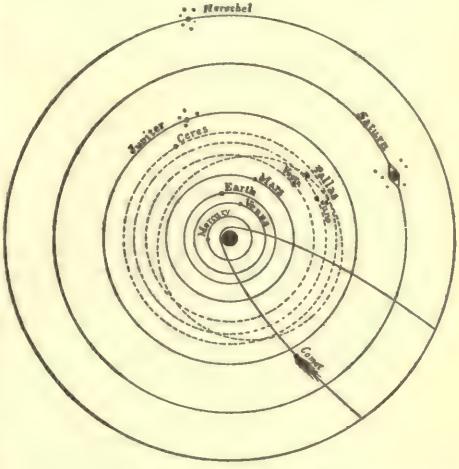
The planets move round the sun on nearly one level or plane, corresponding with the centre of his body, and in one direction, from west to east. The secondary planets, in like manner, move in planes round the centres of their primaries, and in the same direction, from west to east. These are denominated revolutionary mo-

tions; and it is to be observed that they are double in the case of the satellites, which have at once a revolution round the primary, and a revolution, in company with the primary, round the sun. The path described by a planet in its revolution is called its *orbit*.

Each planet, secondary as well as primary, and the sun also, has a motion in its own body, like that of a bobbin upon a spindle. An imaginary line, forming, as it were, the spindle of the sun or planet, is denominated the *axis*, and the two extremities of the axis are called the poles. The axes of the sun and planets are all nearly at a right angle with the plane of the revolutionary movements. The motion on the axis is called the rotatory motion, from *rota*, the Latin for a wheel. The sun, the primary planets, and the satellites, with the doubtful exception of two attending on Uranus, move on their axes in the same direction as the revolutionary movements, from west to east.

The Sun is a sphere or globe of 865,000 miles in diameter, and rotates, or revolves upon its axis, in between twenty-five and twenty-six days. When viewed through a telescope, the surface appears intensely bright and luminous, as if giving out both heat and light to the surrounding planets. But on this surface there occasionally appear dark spots, generally surrounded with a border of less dark appearance; some of which spots have been calculated to be no less than 45,000 miles in breadth, or nearly twice as much as the circumference of the earth. The region of the sun's body on which the spots appear, is confined to a broad space engirdling his centre. These are sometimes observed to come into sight at his western limb, to pass across his body in the course of twelve or thirteen days, and then disappear. They are sometimes observed to contract with great rapidity, and disappear like something melted and absorbed into a burning fluid. Upon the bright parts of the sun's body there are also sometimes observed streaks of unusual brightness, as if produced by the ridges of an agitated and luminous fluid. It has been surmised, that the sun is a dark body, enveloped in an atmosphere calculated for giving out heat and light, and that the spots are produced by slight breaks or openings in that atmosphere, showing the dark mass within. Though so much larger than the earth, the matter of the sun is only about a fourth of the density or compactness of that of our planet, or little more than the density of water.

The sun is surrounded to a great distance by a faint light, or luminous matter of extreme thinness, shaped like a lens or magnifying-glass, the body of the sun being in the centre, and the luminous matter extending in the plane of the planetary revolutions, till it terminates in a point. At particular seasons, and in favorable states of the atmosphere, it may be observed before sunrise, or after sunset, in



THE SOLAR SYSTEM

RATE OF MOVEMENT OF THE PLANETS IN MILES PER MINUTE.—Mercury, 1796; Venus, 1334; Earth, 1133; Mars, 905; Vesta, 905; Juno, 905; Ceres, 693; Pallas, 693; Jupiter, 490; Saturn, 363; Uranus, 255; Moon, 38.

DENSITIES OF PLANETS COMPARED WITH WATER, WHICH IS CONSIDERED AS ONE.—The Sun, 1, 2-13ths; Mercury, 9, 1-6th; Venus, 5, 11-15ths; Earth, 4, 5-10ths; Mars, 3, 2-7ths; Jupiter, 1, 1-24th; Saturn, 0, 13-32ds; Uranus, 0, 99-100ths.

INCLINATIONS OF ORBITS TO THE ECLIPTIC.—Mercury, 7° 0′ 9″ 1; Venus, 3° 23′ 28″ 5; Mars, 1° 51′ 6″ 2; Vesta, 7° 5′ 9″ 0; Juno, 13° 4′ 9″ 7; Ceres, 10° 37′ 26″ 2; Pallas, 34° 34′ 55″ 0; Jupiter, 1° 18′ 51″ 3; Saturn, 2° 29′ 35″ 7; Uranus, 0° 46′ 28″ 4.

the form of a cone pointing obliquely above the place where the sun is either about to appear or which he has just left. It is termed the *Zodiacal Light*.

Mercury, the nearest planet to the sun, is a globe of about 2,992 miles in diameter, rotating on its axis in 24 hours and 5½ minutes, and revolving round the central luminary, at a distance of 33,900,000 miles in 88 days. From the earth it can only be seen occasionally in the morning or

evening, as it never rises before, or sets after the sun, at a greater distance of time than 1 hour and 50 minutes. It appears to the naked eye as a small and brilliant star, but when observed through a telescope, is horned like the moon, because we only see a part of the surface which the sun is illuminating. Mountains of great height have been observed on the surface of this planet, particularly in its lower or southern hemisphere. One has been calculated at 10¾ miles in height, being about eight times higher, in proportion to the bulk of the planet, than the loftiest mountains upon earth. The matter of Mercury is of much greater density than that of the earth, equalling lead in weight, so that a human being placed upon its surface would be so strongly drawn toward the ground as scarcely to be able to crawl.

Venus is a globe of about 7,660 miles in diameter, or nearly the size of the earth, rotating on its axis in 23 hours, 21 minutes and 19 seconds, and revolving round the sun, at the distance of 67,200,000 of miles in 225 days. Like Mercury, it is visible to an observer on the earth only in the morning and evening, but for a greater space of time before sunrise and after sunset. It appears to us the most brilliant and beautiful of all the planetary and stellar bodies, occasionally giving so much light as to produce a sensible shadow. Observed through a telescope, it appears horned, on account of our seeing only a part of its luminous surface. The illuminated parts of Venus occasionally presents slight spots. It has been ascertained that its surface is very unequal, the greatest mountains being in the southern hemisphere, as in the case of both Mercury and the earth. The higher mountains in Venus range between 10 and 22 miles in altitude. The planet is also enveloped in an atmosphere like that by which animal and vegetable life is supported on earth, and it has consequently a twilight. Venus performs its revolution round the sun in 225 days. Mercury and Venus have been termed the Inferior Planets, as being placed within the orbits of the earth.

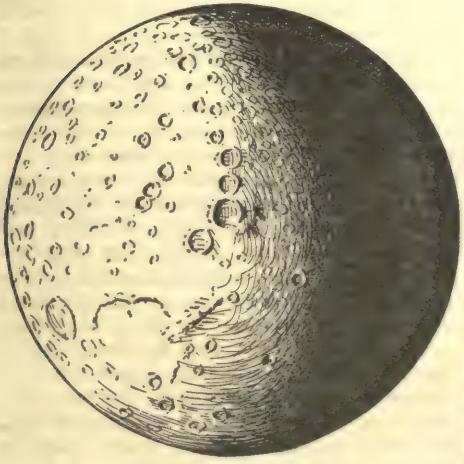
The Earth, the third planet in order, and one of the smaller in size, though not the smallest, is important to us, as the theatre on which our race have been placed to "live, move, and have their being." It is 7,918 miles in mean diameter, rotating on its axis in 24 hours, at a mean distance of 95,000,000 of miles from the sun, round which it revolves in 365 days, 5 hours. 56 minutes, and 57 seconds. As a planet viewed from another of the planets, suppose the moon, "it would present a pretty, variegated, and sometimes a mottled appearance. The distinction between its seas, oceans, continents, and islands would be clearly marked; they would appear like brighter and darker spots upon its disk. The continents would appear bright, and the ocean of a darker hue, because water absorbs the greater part of the solar light that falls upon it. The level plains (excepting, perhaps, such regions as the Arabian deserts of sand) would appear of a somewhat darker color than the more elevated and mountainous regions, as we find to be the case on the surface of the moon. The islands would appear like small bright specks on the darker surface of the ocean; and the lakes and Mediterranean seas like darker spots on broad streaks intersecting the bright parts, or the land. By its revolution round the axis, successive portions of the surface would be brought into view, and present a different aspect from the parts which preceded."

The form of the earth, and probably that of every other planet, is not strictly spherical, but spheroidal, that is, flattened a little at the poles, or extremities of the axis. The diameter of the earth at the axis is 26 miles less than in the cross direction. This peculiarity of the form is a consequence of the rotatory motion, as will be afterward explained.

The earth is attended by one satellite, the *Moon*, which is a globe of 2,160 miles in diameter, and consequently about a 49th part of the bulk of the earth, revolving round its primary in 27 days, 7 hours, 43 minutes, and 11 seconds, at the distance of 238,000 miles. The moon is 400 times nearer the earth than the sun is; but, its diameter being at the same time 400 times less than that of the sun, it appears to us of about the same size. The moon rotates on her axis in exactly the same time as she revolves round the earth. She consequently presents at all times the same part of her surface toward the earth. Inspected through a telescope, her surface appears of unequal brightness and extremely rugged. The dark parts, however, are not seas, as has been supposed, but more like the beds of seas, or great alluvial plains. No appearance of water, or of clouds, or of an atmosphere, has been detected. The surface presents numerous mountains, some of them about a mile and three-quarters in height, as has been ascertained by meas-

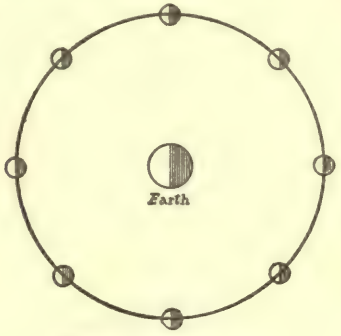
urement of the shadows which they cast on the neighboring surface. The tops of the mountains of the moon are generally shaped like a cup or basin, with a small eminence rising from the centre, like many volcanic hills on the earth. It has hence been surmised that the moon is in a *volcanic state,* as the earth appears to have been for many ages before the creation of man, and that it is perhaps undergoing processes calculated to make it a fit scene for animal and vegetable life.

The moon turning on its axis once in a little more than 27 days, presents every part of its surface in succession to the sun in that time, as the earth does in 24 hours. The *day* of the moon is consequently nearly a fortnight long, and its *nights* of the same duration. The light of the sun, falling upon the moon, is partly absorbed into its body; but a small portion is reflected or thrown back, and becomes what we call *moonlight.* The illuminated part from which we derive moonlight is at all times increasing or diminishing in our eyes, as the moon proceeds in her revolution around our globe. When the satellite is at the greatest distance from the sun, we, being between the two, see the whole of the illuminated surface,



TELESCOPIC APPEARANCE OF THE MOON

which we accordingly term *full moon.* As the moon advances in her course, the luminous side is gradually averted from us, and the moon is said to wane. At length, when the satellite has got between the earth and the sun, the luminous side is entirely lost sight of. The moon is then said to *change.* Proceeding in her revolution, she soon turns a bright edge toward us which we call the *new moon.* This gradually increases in breadth, till a moiety of the circle is quite filled up; it is then said to be *half moon.* The luminary, when on the increase from *new* to *half,* is termed



PHASES OF THE MOON

a crescent, from *crescens,* Latin for increasing; and this word has been applied to other objects of the same shape—for instance, to a curved line of buildings.

In the early days of the new moon, we usually see the dark part of the body faintly illuminated, an appearance termed the *old moon in the new moon's arms.* This faint illumination is produced by the reflection of the sun's light from the earth, or what the inhabitants of the moon, if there were any, might be supposed to consider as moonlight. The earth, which occupies one invariable place in the sky of the moon, with a surface thirteen times larger than the apparent size of the moon in our eyes, is then *at the full,* shining with great lustre on the sunless side of its satellite, and receiving back a small portion of its own reflected light. The light, then, which makes the dark part of the moon visible to us, may be said to perform three journeys, first from the sun to the earth, then from the earth to the moon, and finally from the moon back to the earth, before our eyes are enabled to perceive this object.

Mars, the fourth of the primary planets, is a globe of 4,189 miles in diameter, or little more than a half of that of the earth; consequently, the bulk of this planet is only about a fifth of that of our globe. It performs a rotation on its axis in 24 hours, 37 minutes, and 22 seconds, and revolves round the sun, at a distance of 141,000,000 of miles, in 686 days, 22 hours, and 18 seconds. Mars appears to the naked

eye of a red color; from which circumstance it was, probably, that the ancients bestowed upon it the name of the god of war. Inspected through a telescope, it is found to be occasionally marked by large spots and dull streaks, of various forms, and by an unusual brightness of the poles, As the bright polar parts sometimes project from the circular outline of the planet, it has been conjectured that these are masses of snow, similar to those which beset the poles of the earth.

Vesta, Ceres, Pallas, and *Juno* are among the globes revolving between the orbits of Mars and Jupiter, in paths near and crossing each other, and which are not only much more elliptical than the paths of the other planets, but also rise and sink much further from the plane of the general planetary revolutions.

Vesta is of a bulk only 1-15,000th part of the bulk of the earth, with a surface not exceeding that of the kingdom of Spain. It revolves round the sun in 3 years, 66 days, and 4 hours, at a mean distance of 225,500,000 miles. Though the smallest of all the planets, it gives a very brilliant light, insomuch that it can be seen by the naked eye.

Juno is 1,425 miles in diameter, and presents, when inspected through the telescope, a white and well-defined appearance. Its orbit is the most eccentric of all the planetary orbits, being 253,000,000 of miles from the sun at the greatest, and only 126,000,000, or less than one-half, at the least distance. In the half of the course nearest to the sun, the motion of the planet is, by virtue of a natural law afterward to be explained, more than twice as rapid as in the other part.

Ceres has been variously represented as of 1,624 and 160 miles in diameter. The astronomer who calculated its diameter at 1,624 miles, at the same time believed himself to have ascertained that it has a dense atmosphere, extending 675 miles from its surface. It is of a reddish color, and appears about the size of a star of the eighth magnitude. Ceres revolves round the sun, at a distance of 260,000,000 of miles, in 4 years, 7 months, and 10 days.

Pallas has been represented as of 2,099 miles in diameter, with an atmosphere extending 468 miles above its surface. Another astronomer has allowed it a diameter of only 80 miles. It revolves round the sun, at a mean distance of 266,000,000 miles, in 4 years, 7 months, and 11 days. However unimportant it may appear beside the large planets, it has a peculiar interest in the eyes of astronomers, on account of its orbit having a greater inclination to the plane of the ecliptic than those of all the larger planets put together.

Jupiter is the largest of all the planets. Its diameter is nearly eleven times that of the earth, or 85,000 miles, and its volume or mass is consequently 1,200 times that of our globe. The density of Jupiter is only a fourth of that of the earth, or about the lightness of water; and a human being, if transferred to it, would be able to leap with ease over a pretty large house. It performs a rotation on its axis in 9 hours, 55 minutes, and 33 seconds, or about two-fifths of our day. It revolves round the sun, at a distance of 482,000,000 miles, in 4,332 days, 14 hours, and 24 minutes, or nearly twelve of our years. Viewed through a telescope, Jupiter appears surrounded by dark lines, or belts, which occasionally shift, melt into each other, or separate, but sometimes are observed with little variation for several months. These belts are generally near the equator of the planet, and of a broad and straight form; but they have been observed over his whole surface, and of a lighter, narrower, and more streaky and wavy appearance. It is supposed that the dark parts are lines of the body of the planet, seen through openings in a bright, cloudy atmosphere.

Jupiter is attended by five satellites, which revolve round it, in the same manner as the moon round our globe, keeping, like it, one face invariably presented to their primary. They are of about the same size or a little larger in diameter than our moon; the first having a diameter of 2,508, the second of 2,068, the third of 3,377, and the fourth of 2,890 miles. The first revolves round the primary planet in 1 day 18 hours 28 minutes; the second in 3 days 13 hours 14 minutes; the third in 7 days 3 hours 43 minutes; and the fourth in 16 days 16 hours 32 minutes. These satellites frequently eclipse the sun to Jupiter; they are also eclipsed by the primary planet, but never all at the same time. Little is known about the fifth satellite.

Saturn, seen through a telescope, is the most remarkable of all the planets, being surrounded by rings and attended by seven satellites. In bulk this is the second of the planets, being 71,000 miles in diameter, or about 900 times the volume of the earth. Its surface appears slightly marked by belts like those of Jupiter. It performs a rotation on its axis in 10 hours 14

minutes, and revolves round the sun at a distance of 884,000,000 miles, in 10,759 days 2 hours 3 minutes, or about 29½ of our years. At such a distance from the sun, that luminary must be diminished to one-eightieth of the size he bears in our eyes, and the heat and light in the same proportion. The matter of Saturn is one-eighth of the density of our earth.

The rings of Saturn surround the body of the planet in the plane of its equator. They are thin, like the rim of a spinning-wheel, and are always seen with the edge presented more or less directly toward us. They are luminous with the sun's light, and cast a shadow on the surface of the planet, whose shadow is also sometimes seen falling on part of the rings. The distance of the inner edge from the planet is calculated at about 19,000 miles, the entire breadth from the inner to the outer edge is 28,538, and the thickness is not more than 100. In certain positions of the planet we can see their surface at a considerable angle, and the openings or loops which they form on the sides of the planet. At other times we see their dark side, or only their edges. They are also occasionally marked by small spots. The rings of Saturn rotate on their own plane in 10 hours, 32 minutes, 15 seconds, and a part of a second, being about the same time with the rotation of the planet.

The nine satellites of Saturn revolve around it, on the exterior of the rings, and almost all of them in nearly the same plane. They are so small as not to be visible without a powerful telescope. The two inner ones are very near to the outer edge of the rings, and can only be discerned when the rings are presented so exactly edgewise as to be almost invisible. They have then been seen passing like two small bright beads along the minute thread of light formed by the edge of the rings. The three next satellites are also very small; the sixth is larger, and placed at a great interval from the rest. The eighth is the largest; it is about the size of the planet Mars, and is situated at nearly thrice the distance of the sixth, or about 2,300,000 miles from the body of Saturn.

The revolutions of these satellites range from 1 to 79 days; and it has been ascertained of some of them that, according to the usual law of secondary planets, their rotations on their axes and their revolutions round their primary are performed in the same time, so that, like our moon, they always present the same face to the centre of their system. The orbit of the eighth satellite is much inclined to the plane of Saturn's equator.

Uranus, or *Herschel*, given the latter name after its discoverer, is a globe of 31,700 miles in diameter, rotating on its axis in 7 hours, and performing a revolution round the sun, at a distance of 1,780,000,000 of miles, in 84 of our years. The sun to this remote planet must appear only a 400th part of the size which he bears in our eyes. Four satellites, or moons, are now known to attend upon Uranus.

The two which were first observed circulate round their primary in orbits almost perpendicular to the ecliptic, and are further supposed to move in a direction contrary to that of all the other planetary motions—namely, from east to west.

Neptune, the eighth and furthermost of the principal planets of our solar system, is not visible to the naked eye. Its existence was discovered, in 1846, by the computations of Leverrier, of Paris, and Adams, of Cambridge. At the request of Leverrier, Dr. Galle, of Berlin, looked for this huge planet and found it. Neptune is 2,780,000,000 miles from the sun, and requires 60,127 days to make its periodic revolution around the sun. The period of its axial rotation is not yet known.

Unlike Jupiter, Saturn and Uranus, Neptune is not well supplied with satellites, having but one. The inhabitants of this planet, if it has any, must live in what we might call perpetual night time, for at so great a distance the sun would seem only about the size of a pinhead. While the diameter of Neptune is 34,500 miles, its density is calculated to be but one-fifth that of the earth. Lalande is believed to have been the first astronomer to see Neptune, in 1785, but he failed to recognize it as a planet.

Some idea may be obtained of the comparative size of the principal objects of the solar system, by supposing a globe of two feet in diameter, placed in the centre of a level plain, to represent the sun; a grain of mustard-seed, placed on the circumference of a circle 164 feet in diameter, for Mercury; a pea, on a circle of 284 feet, for Venus; another pea, on a circle of 430 feet, for the Earth; a large pin's-head, on a circle of 654 feet, for Mars; four minute grains of sand, in circles of from 1,000 to 1,200 feet, for Vesta, Ceres, Pallas, and Juno; a moderate sized orange, on a circle of nearly half a mile in diameter, for Jupiter; a small orange,

on a circle four-fifths of a mile in diameter, for Saturn; and a small plum or full-sized cherry, on a circle of a mile and a half in diameter, for Uranus. It is calculated that the united mass of the whole of the planets is not above a 600th part of the mass of the sun.

The sun and planets are represented, with an approximation to correctness, in philosophical toys termed orreries.

THE COMET

Comets are light vapory bodies, which move round the sun in orbits much less circular than those of the planets. Their orbits, in other words, are very long ellipses, or ovals, having the sun near one of the ends. Comets usually have two parts, a body or nucleus, and a tail; but some have a body only.

The body appears as a thin, vapory, luminous mass, of globular form; it is so thin, that, in some cases, the stars have been seen through it. The tail is a lighter or thinner luminous vapor surrounding the body, and streaming far out from it, in one direction. A vacant space has been observed between the body and the enveloping matter of the tail; and it is equally remarkable that the tail has in some instances appeared less bright along the middle, immediately behind the nucleus, as if it were a stream which that nucleus had in some measure parted into two.

Out of the great multitude—certainly not less than 1,000—which are supposed to exist, above 150 have been made the subject of scientific observation. Instead of revolving, like the planets, nearly on the plane of the sun's equator, it is found that they approach his body from all parts of surrounding space. At first, they are seen slowly advancing, with a comparatively faint appearance. As they approach the sun, the motion becomes quicker, and at length they pass round him with very great rapidity, and at a comparatively small distance from his body. The comet of 1680 approached within one-sixth of his diameter. After passing, they are seen to emerge from his rays, with an immense increase to their former brilliancy and to the length of their tails. Their motion then becomes gradually slower, and their brilliancy diminishes, and at length they are lost in distance. It has been ascertained that their movement round the sun is in accordance with the same law which regulates the planetary movements, being always the quicker the nearer to his body, and the slower the more distant. In the remote parts of space their motions must be extremely slow.

Three comets have been observed to return, and their periods of revolution have been calculated. The most remarkable of these is one usually denominated Halley's Comet, from the astronomer who first calculated its period. It revolves round the sun in about seventy-five years, its last appearance being at the close of 1835. Another, called Encke's Comet, from Professor Encke, of Berlin, has been found to revolve once in 1,207 days, or 3⅓ years; but, in this case, the revolving body is found, at each successive approach to the sun, to be a little earlier than on the previous occasion, showing that its orbit is gradually lessening, so that it may be expected ultimately to fall into the sun. This fact has suggested that some part of that space through which the comet passes must be occupied by a matter presenting some resistance to the movement of any denser body; and it is supposed that this matter may prove to be the same which has been described as constituting the zodiacal light. It is called a *resisting medium;* and future observations upon it are expected to be attended with results of a most important nature, seeing that, if there be such a matter extending beyond the orbit of the earth, that planet, in whose welfare we are so much interested, will be exposed to the same ultimate fate with Encke's Comet.

The third, named Beila's Comet, from M. Beila, of Josephstadt, revolves round the sun in 6¾ years. It is very small, and has no tail. In 1832, this comet passed through the earth's path about a month before the arrival of our planet at the same point. If the earth had been a month earlier at that point, or the comet a month later in crossing it, the two bodies would have been brought together, and the earth, in all probability, would have instantly become unfit for the existence of the human family.

Comets often pass unobserved, in consequence of the part of the heavens in which they move being then under daylight. During a total eclipse of the sun, which happened sixty years before Christ, a large comet, not formerly seen, became visible, near the body of the obscured luminary. On many occasions, their smallness and distance render them visible only by the aid of the telescope. On other oc-

casions, they are of vast size. The comet now called Halley's, at its appearance in 1456 covered a sixth part of the visible extent of the heavens, and was likened to a Turkish cimeter. That of 1680, which was observed by Sir Isaac Newton, had a tail calculated to be 123,000,000 miles in length, a space greater than the distance of the earth from the sun. There was a comet in 1744, which had six tails, spread out like a fan across a large space in the heavens. The tails of comets usually stretch in the direction opposite to the sun, both in advancing and retiring, and with a slight wave at the outer extremity, as if that part experienced some resistance.

THE STARS

The idea at which astronomers have arrived respecting the stars, is that they are all of them suns, resembling our own, but diminished to the appearance of mere specks of light by the great distance at which they are placed. As a necessary consequence to this supposition, it may be presumed that they are centres of light and heat to systems of revolving planets, each of which may be further presumed to be the theatre of forms of beings bearing some analogy to those which exist upon earth.

The stars, seen by the naked eye on a clear night, are about two thousand in number. This, allowing a like number for the half of the sky not seen, gives about four thousand, in all, of visible stars. These are of different degrees of brilliancy, probably in the main in proportion to their respective distances from our system, but also perhaps in some measure in proportion to their respective actual sizes. Astronomers class the stars under different *magnitudes,* not with regard to apparent size, for none of them presents a measurable disk, but with a regard to the various quantities of light flowing round them; thus, there are stars of the first magnitude, the second magnitude, and so on. Only six or seven varieties of magnitude are within our natural vision; but with the telescope vast numbers of more distant stars are brought into view; and the magnitudes are now extended by astronomers to at least sixteen.

The stars are at a distance from our system so very great, that the mind can form no idea of it. The brilliant one called Sirius or the Dog-star, which is supposed to be the nearest, merely because it is the most luminous, has been reckoned by tolerably clear calculation to give only 1-20,000,000th part of the light of the sun; hence, supposing it to be of the same size, and every other way alike, it should be distant from our earth not less than 1,960,000,000,000,000,000 miles. An attempt has been made to calculate the distance of Sirius by a trigonometrical problem. It may be readily supposed that the position of a spectator upon the earth with respect to celestial objects must vary considerably at different parts of the year: for instance, on the 21st of June, he must be in exactly the opposite part of the orbit from what he was on the 21st of December—indeed, no less than 190,000,000 of miles from it, or twice the distance of the earth from the sun. This change of position with relation to celestial objects is called *parallax.* Now, it has been found that Sirius is so distant, that an angle formed between it and the two extremities of the earth's orbit is too small to be appreciated. Were it so much as one second, or the 3,600th part of a degree, it could be appreciated by the nice instruments we now possess; but it is not even this. It is hence concluded that Sirius must be at least 19,200,000,000 of miles distant, however much more! Supposing this to be its distance, its light would take three years to reach us, though traveling, as it does, at the rate of 192,000 miles in a second of time!

OUTLINES OF GEOLOGY

GEOLOGY (from the Greek, *ge*, the earth, and *logos*, discourse) may be defined as the science which describes the solid materials of the earth, the order in which they are arranged, the causes which have effected that arrangement, and the organic remains which are found in them.

At some places the surface of the earth is found to consist of a hard rock of crystalline or glassy texture, generally called granite, though subject to a considerable number of varieties. Granite is never, except in peculiar circumstances, found in the form of a layer, whether thick or thin, but generally in large, irregular-shaped masses; and no other kind of rock, except in equally rare and peculiar circumstances, is ever found beneath it.

At other places the earth's immediate surface is found composed of some one of certain kinds of rock not less hard in texture than granite, and also of a crystalline consistence, but always found *in layers or beds*, generally of great thickness.

At other places we find, near the surface of the earth, rocks of a comparatively soft and not of a crystalline consistence, forming also layers or beds, of greater or less thickness.

In some places, rock of a very hard kind is found, not exactly like any of the above, deposited in irregular forms, and often with the appearance of having penetrated through gaps forcibly made in other rocks.

Finally, throughout the first three classes of rocks, but particularly the first two, there are thin *veins* of diverse substances, including minerals.

THE STORY OF THE ROCKS

ROCKS of the first class are denominated PLUTONIC (from Pluto, the god of the infernal regions among the ancients), as supposed to have been formed at great depths in the earth, the matter having been originally in a hot and soft state, and afterward cooled and crystallized slowly, under such enormous pressure as prevented the contained gases from expanding. The term *unstratified* is also applied to this class of rocks.

Rocks of the second and third classes are called AQUEOUS, as composed of matter deposited by water. Those of the second class are more specially named *Metamorphic* (from the Greek, *metamorphosis*, a transformation), as supposed to have undergone a remarkable change in the course

of their formation. It is supposed that the matter of these rocks, derived from rocks of the granitic kind, and suspended in vast oceans, was, when deposited, subjected to a great heat from below, which gave it, in its reconsolidation, much of that crystalline texture which it had in its plutonic form.

Rocks of the fourth class are denominated VOLCANIC, as being evidently composed of lavas, or masses of fire-melted rocky matter, which have been sent upward by volcanoes.

Rocks of the second and third classes are likewise called *Stratified Rocks,* as being invariably found in strata or layers. Rocks of the first and fourth classes, as wanting this peculiarity, are distinguished as *Unstratified Rocks.*

The plutonic and some of the lower metamorphic rocks have been also called *Primary,* or *Primitive Rocks,* as either the first formed of all, or formed very early. The upper metamorphic rocks have in like manner been called the *Transition Series,* as forming a kind of link between the primary and those which follow, and partaking of the characters of both. Of the remainder of the aqueous rocks, a considerable number, being the lower portion, are sometimes called the *Secondary Rocks,* while the upper are named *Tertiary. Igneous Rock* is also a variant name for the volcanic kind.

When rocks of various classes are seen at or near the same place, it is found that those of the second (except in the extraordinary circumstances alluded to), lie above those of the first; and those of the third above those of the second and first classes. Special kinds of aqueous rock are also found in a certain order above one another—much in the same way as if we were to place a book of many volumes on its side, having previously arranged the volumes according to their numbers, in which case the second would be above the first, the third above the second, and so on. Rocks are thus said to observe an *order of superposition*—the volcanic kind alone observing no order.

In some of the upper metamorphic rocks, and in all those of the secondary and tertiary series, remains of plants and animals are found, showing that when these rocks were formed, the earth had become a scene of vegetable and animal life. The rocks containing these *organic remains* or *fossils,* are called FOSSILIFEROUS; and the remaining rocks, from their containing no such relics, are called NON-FOSSILIFEROUS.

The changes produced by the united operations of aqueous and igneous agency are in part represented in the subjoined engraving of a supposed section of part of the earth's crust.

Now to begin our lesson!

Here are three pieces of stone:—

1. A piece of Sandstone.
2. A piece of Granite.
3. A piece of Chalk.

You are quite familiar with each of these kinds of stone. Sandstone is a common material for walls, lintels, hearths, and flagstones. Granite may now be frequently seen in polished columns and slabs in public buildings, shops, and in tombstones; and the streets in many of our large cities and towns are now paved with it. Common white chalk is well known to everybody.

Take the piece of sandstone in your hands and examine it carefully, using even a magnifying glass if the grains are minute. Then write down each of the characters you observe one after another. You will of course pay little heed to the color, for sandstone, like books, may be red or white, green or yellow, or indeed of almost any color. Nor will you give much weight to the hardness or softness as an essential character, for you may find even in a small piece of the stone that one part is quite hard while a neighboring place is soft and crumbling.

If your piece of sandstone has been well chosen for you, you will be able to write down the following characters:—

1. The stone is made up of small grains.
2. The grains are all more or less rounded or worn.
3. By scraping the surface of the stone these rounded grains can be separated from the stone, and when they lie in this loose state they are seen to be mere grains of sand.
4. More careful examination of the stone shows that the grains tend to lie in lines, and that these lines run in a general way parallel with each other.
5. The grains differ from each other in size and in the material of which they are made. Most of them consist of a very hard white or colorless substance like glass, some are perhaps small spangles of a material which glistens like silver, others are softer and of various colors. They lie touching each other in some sandstones;

in others they are separated by a hard kind of cement which binds them all into a solid stone. It is this cement which usually colors the sandstone, since it is often red or yellow, and sometimes green, brown, purple, and even black.

Summing up these characters in a short definition, you might describe your sandstone as a stone composed of worn, rounded grains of various other stones arranged in layers.

Proceed now in the same way with the piece of granite. You find at once a very different set of appearances, but after a little time you will be able to make out and to write down the following:—

The stone contains no rounded grains.

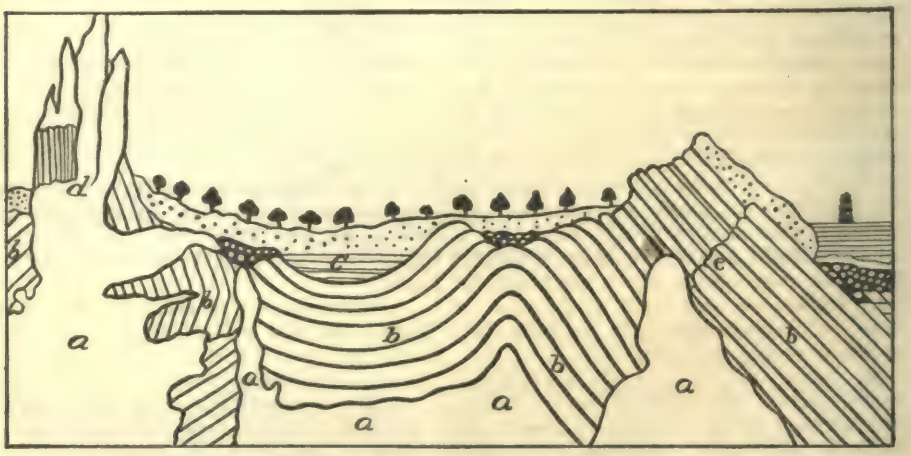
It is composed of three different substances, each of which has a peculiar crystalline form. Thus, one of these, called feldspar, lies in long smooth-faced, sharply defined crystals of a pale flesh color, or dull white, which you can with some difficulty scratch with the point of a knife. Another, termed mica, lies in bright glistening plates, which you can easily scratch and split up into thin transparent leaves. If you compare these shining plates with the little silvery spangles in the sandstone, you will see that they are the same material. The third, named quartz, is a very hard, clear, glassy substance on which your knife makes no impression, but which you may recognize as the same material out of which most of the grains of the sandstone are made.

The crystals in granite do not occur in any definite order, but are scattered at random through the whole of the stone.

Here are characters strikingly different from those of the sandstone. You might make out of them such a short definition as this—Granite is a stone composed of distinct crystals, not laid down in layers, but irregularly interlaced with each other.

Lastly go through the same process of examination with your piece of chalk. At first sight this stone seems to have no distinct characters at all. It is a soft, white, crumbling substance, soils your fingers when you touch it, and seems neither to have grains like the sandstone nor crystals like the granite. You will need to use a magnifying-glass, or even perhaps a microscope, to see what the real nature of chalk is. Take a fine brush and rub off a little chalk into a glass of clear water; then shake the water gently and let it stand for a while until you see a layer of sediment on the bottom. Pour off the water and place a little of this sediment upon a piece of glass, and look at it under the microscope or magnifying-glass. You will find it to have strongly marked characters, which might be set down thus:—

The stone, though it seems to the eye much more uniform in its texture than either sandstone or granite, is made up



(*a*) Primary Rock, which has been thrown up, so as to disturb and mix itself with the Secondary Rocks; (*b*) Secondary Rock, thrown into inclinations and curves by the rising of the Primary Rock; (*c*) Tertiary Formation, deposited in a hollow formed by the disturbance of the Secondary Rocks; (*d*) Basaltic Columns; (*e*) A fault or hitch in the strata. The Circles are bowlders or detached stones rounded by travelling in water, and deposited in hollows formed by water. The dots indicate beds of gravel, immediately beneath the soil.

of particles resembling each other in color and composition, but presenting a variety of forms.

It consists of minute shells, pieces of coral, fragments of sponges, and white particles, which are evidently the broken-down remains of shells.

As a brief description of chalk you might say that it is a stone formed out of the remains of once living animals.

WHAT STONES HAVE TO TELL US

We take again our three pieces of stone —sandstone, chalk, and granite—and compare other stones with them. We get out of town to the nearest pit or quarry or ravine, to any opening in fact, either natural or artificial, which will enable us to see down beneath the grass and the soil of the surface. In one place we may find a clay-pit, in another a sandstone quarry, in another a railway cutting through chalk or limestone, in another a deep ravine in hard rocks with a stream flowing at its bottom.

It does not matter for our present purpose what the nature of the opening be, provided it shows us what lies beneath the soil. In all such places we meet with stone of some kind, or of many different kinds. By a little practice we learn that these various sorts of stones may be usually arranged under one or other of the three divisions. For example, a large number of stones will be found answering to the general description which you found to be true of sandstone. These will of course be placed together with our piece of sandstone. Another considerable quantity of stones will be met with made up wholly, or almost wholly, of the remains of plants or of animals. These we arrange in the same division with our piece of chalk. Lastly, a good many stones may be met with built up of crystals of different kinds, and these, for the present, we class together with our piece of granite.

SEDIMENTARY ROCKS

To each of these groups names must be given. We might call them the Sandstone group, the Chalk group, and the Granite group. But it happens that other names have been already in use, which will be more convenient. Accordingly we shall refer all stones having characters like those of sandstone to the Sedimentary Rocks; those formed of the remains of plants or animals, as chalk is, to the Organic Rocks; and those having a crystalline character, like our granite group, to the Igneous Rocks. The meaning of these names will be seen as we proceed.

The word "rock" is applied to any kind of natural stone, whatever may be its hardness or softness. In this sense, sand, mud, clay, peat, and coal are rocks, as much as sandstone, limestone, or granite.

Sediment is something which, after having been suspended in or moved along by water, has settled down upon the bottom.

The term Sedimentary Rocks is a very expressive one, for it includes stones formed of all kinds of sediment, whether coarse or fine.

HOW GRAVEL, SAND, AND MUD ARE MADE

You have taken the first step in the study of the Sedimentary Rocks—you now know that they are made of sediment, such as gravel, sand, and mud. How then are gravel, sand, and mud made at the present day?

If you were to search on the shore of the sea, or on the banks of a river, you could, without much difficulty, prove in another way that sand and gravel only differ from each other in the size of their grains.

Let us get away up among the hills, and watch what goes on where the brooks first begin to flow. Where the rocks are hard and tough, they rise out of the hillsides, as prominent crags and cliffs, down which the little streamlets dance from ledge to ledge before they unite into larger streams in the bottom of the valleys. Now let us descend the brook and look at its channel carefully as we go. The red fragments from that crag will be easily distinguishable from the other dull gray stones, which have been detached from the rest of the crags on either side. If you look narrowly at the bits of stone which are strewn about upon the slope you will notice that they are all more or less angular in shape; that is to say, they have sharp edges. But those in the brook are not quite so rough or so sharp-edged as those on the bare hillside above. Follow the brook down the valley for some way and then take another look at the stones in the bed of the stream. You do not now find so many big blocks of the red stone, and those you do meet with are more rounded and worn than they were near the crag. They have grown smooth and polished, their edges

have been worn off, and many of them are well rounded. Once more you make a further examination still lower down the valley, and here and there where the stream has thrown up a bank of gravel, you find that the pieces of our red crag have been so well ground away that they now form part of an ordinary water-worn gravel.

HOW GRAVEL, SAND, AND MUD BECOME SEDIMENTARY ROCKS

So long as a current of water is moving swiftly it keeps the gravel, sand, and mud from setting down on the bottom. A rapid current will hurry along, not only mud and sand, but even gravel. As its rapidity flags, first the gravel will sink to the bottom as a sediment, the sand will sink more slowly and be carried further, while the mud will hang in the water for a long time, travel a much greater distance, and only fall with extreme slowness to the bottom.

The sheets of sand, gravel, or mud which can be seen on the seashore, or at any lake or pool on land, are soft or loose materials. Sandstone, conglomerate, shale, or any other sedimentary rock, is usually more or less hard or compact.

A sedimentary rock, then, is one formed from sediment which was derived from the waste of older rocks, and deposited in water. It usually shows the stratified arrangement characteristic of water-formed deposits. Since its original formation it has usually been hardened into stone by pressure or infiltration.

THE REMAINS OF PLANTS AND ANIMALS

Rain can wash away leaves and other pieces of plants, and allow them to drop in a pool, where they become interstratified with the silt, that is, are deposited between its layers and covered over by it.

You can now see, therefore, how it is that pieces of ferns or any other kind of land plants should be found in the heart of such a solid stone as a piece of shale. The stone was once merely so much sediment laid down below water, and the fragmentary plants were drifted away from the place where they grew until at last they were buried among that sediment.

It is not only plants, however, which occur imbedded in sedimentary rocks. You will notice a number of shells and other animal remains.

A QUARRY AND ITS LESSONS

Let us suppose ourselves to be in a quarry.

In the first place, what feature about the quarry strikes you most forcibly when you enter? You answer readily, the Stratification of the rocks.

In the second place, you observe that they do not all consist of the same materials. Some are fine conglomerate, others of various kinds of sandstone, and some of different sorts of shales or clays.

In the third place, let us ask you to point out which are the oldest of the beds. You answer without hesitation that those at the bottom of the quarry must be the oldest, because they certainly were deposited before these lying above them.

We split open some of the lower beds of sandstone and find their surfaces often covered with markings. If you have ever walked along a flat sandy beach you must have noticed the ripple-marks which the shallow rippling water leaves on the soft sand. They are precisely like those on the sandstone. You may see them, too, along the shelving margin of a lake, indeed wherever water has been thrown by the wind into little wavelets over a sandy bottom. They betoken shallow water. Hence we have learned one important fact from our quarry, as to the origin of these rocks: viz., that they were not deposited in a deep sea, but in shallow water.

We look still further among these strata, and notice at last that some of them are curiously covered with little round pits, about the size of peas or less. How did these markings come there? You know that when drops of rain fall upon a smooth surface of moist sand, such as that of the beach, they each make a little dent on it.

Here, then, is another fact which throws still more light on the history of these rocks. The ripple-marks show that the water must have been shallow; the rain-prints prove that it must have risen along a beach liable, now and then, to be laid dry to the air and rain. Now can we tell whether the water was salt or fresh? In other words, was this beach the shore of a lake, or of the sea?

Again we turn to the rocks themselves, and from some of the layers of shale we pick out a number of fossils, which enable us to answer the question.

ROCKS FORMED OF THE REMAINS OF PLANTS

Since the leaves, branches, and stems of plants, and the shells or other remains

of animals, are sometimes scattered so abundantly through ordinary sedimentary rocks, it is easy to see that sometimes they may occur in such quantity as to form great deposits of themselves. You could hardly call such deposits sedimentary, in the same sense in which common shale and sandstone are so named. We may term them Organic Rocks, or, Organically derived Rocks, because they owe their origin to the accumulation of what are called organic remains, or fossils; that is, the remains of plants or animals.

We begin with those rocks which have been formed out of the remains of plants. As an illustration let us ask you to examine carefully a piece of coal. If you master all that it has to tell you, you will not have much difficulty in tracing out the history of other rocks belonging to this series.

Now look at one end of a lump of coal, where the edges of the layers are exposed. You can not follow them with the same ease as in the case of a piece of shale, for they seem to blend into one another. But you may notice that among the layers of hard, bright, glossy substance, there occur others of a soft material like charcoal. A mere general look at such a piece of coal would show you that it is stratified.

Let us suppose ourselves at a coal mine. Now, first of all, you see that the coal occurs as a bed, having a thickness of a few feet. This bedded character agreed with what you have already noticed as to the internal layers in the stone, and confirms you in believing that coal is a stratified rock. Next observe that the pavement on which the coal rests, and the roof which covers it, are both made of very different materials from the coal itself. Were you to cut a trench or section through pavement, coal, and roof, you would prove beyond any doubt that the bed of coal lies among beds of common sedimentary rocks.

You are driven to conclude that in truth the under-clay is an old soil, and the bed of coal represents the vegetation which grew upon it.

ROCKS FORMED OUT OF THE REMAINS OF ANIMALS

It is on the floor of the great sea that the most wonderful examples occur of the way in which rocks are gradually built up from the remains of animals to a depth of many hundreds or thousands of feet, and over distances of many hundreds of miles.

To the west of Britain the Atlantic soon and suddenly deepens. Its floor then stretches away to Newfoundland as a vast plain, the lowest part of which is about 14,000 feet below the waves. It was over this wide submarine plain that the telegraph cables had to be laid, and hence numerous soundings were made all the way across from Ireland to the American coast. While in the shallower parts of the sea the bottom was found to be covered with sand, gravel, or mud, from the deeper parts there came up with the sounding-lead a peculiar gray sticky substance known as ooze, which must stretch over that wide deep-sea basin for many thousands of square miles. This ooze when dried looks like a dirty kind of chalk. After the lapse of centuries, if the deposit were to remain undisturbed, and if we could set a watch to measure its growth, we should find it to have risen upward and to have inclosed the remains of any star-fishes or other sea-creatures which chanced to die and leave their remains upon the bottom. Hundreds of feet of such slow-formed deposit have no doubt already been laid down over the bottom of the ocean between Ireland and Newfoundland. Here, then, is a second and notable example of how a deep and far-spread mass of rock may be formed out of the remains of animals.

WHAT IGNEOUS ROCKS ARE

This word igneous means literally fiery. It does not very accurately describe the rocks to which it is applied, but it has long been in use to include all rocks which have been actually melted within the earth, or which have been thrown out at the surface by the action of volcanoes. So that the Igneous Rocks owe their origin to some of the effects of the internal heat of the earth.

You will find that the solid materials cast up by volcanoes are of two kinds—1st, streams of molten rock called Lava, poured down the sides of a volcanic mountain during an eruption: and 2d, immense quantities of dust, sand, and stones, cast up into the air from the mouth of the crater, and falling down upon the mountain, sometimes even all over the surrounding country for a distance of many miles.

Here, then, are two very dissimilar kinds

of rock-material discharged from the interior of the globe. The lava cools and hardens into a solid rock. The loose ashes and stones, likewise, are in time pressed and hardened into more or less firm beds of stone. So that two totally distinct kinds of rock are laid down upon the surface of the earth by the volcano. In the case of the lava, the rock, if you look at it with a magnifying-glass, is seen to be made up of distinct crystals all matted together. The beds of ashes, on the other hand, no matter how compact they may have become, are found to be made up of irregular fragments of various kinds of stone, and of all sizes, from the finest dust up to big blocks. By attending to this very simple and intelligible difference you could arrange igneous rocks into two great groups—1st, the Crystalline, that is, those which are made up of crystals, and which have once been in a melted state; and 2d, the Fragmental, that is, those which consist of the loose materials thrown out during volcanic explosions.

Crystalline Igneous Rocks.—When the rock was still melted it was full of imprisoned steam and gas which were constantly striving to escape to the surface. It was this steam which collected into little bubbles and formed the curious set of holes in the mass of the still molten rock. In the same way the holes which you often see in the heart of a loaf of bread were formed by the struggles of the steam to escape from the dough as it was heated in the oven.

There are Fragmental Igneous Rocks.—Now this is the kind of material under which the old Roman city of Pompeii was buried. It fell upon the streets and houses and gradually covered them up as the eruption of the neighboring volcano continued. And at this day the workmen find the streets and chambers all choked up with layers of coarser and finer volcanic ash and dust.

These masses of consolidated volcanic dust and stones are known by the name of Tuff.

At the present time there are, it is said, about 270 volcanoes either constantly or at intervals throwing out steam, hot ashes, and lava, in different parts of the globe. Even among the perpetual snows of the South Polar regions they have been met with, and also far within the Arctic Circle at the Island of Jan Mayen.

But besides these volcanoes which are still active, many others occur from which no eruptions have ever been seen to take place, and which are therefore called dormant or extinct.

WHERE IGNEOUS ROCKS COME FROM

If we ask you from what source the Igneous Rocks have been derived, you will reply that they have come up from the intensely hot regions within the earth.

Deep Borings and Mines.—If you were taken down to the bottom of a deep mine in the United States, you would find the temperature much warmer there than near the surface, and a similar increase of heat would meet you in the deep mines of every country in the world. You would soon discover, too, that on the whole the deeper the mine the greater the warmth would be.

Experiments of this kind have been made all over the globe, with the result of showing that after we get down for a short and variable distance below the surface, we reach a temperature which remains the same all the year, and that underneath that limit the temperature rises about 1° Fahrenheit for every fifty or sixty feet of descent. If this rate of increase continues, we should get uncomfortably hot before having descended very far. For instance, at a depth of about two miles water would be at its boiling-point, and at depths of twenty-five or thirty miles, the metals would have the same temperatures as those at which they respectively melt on the surface of the earth. It is clear from this kind of evidence that the inside of our planet must be in an intensely heated condition.

THE CRUST OF THE EARTH

This solid rocky outer part of the earth on which we live, into which men sink mines and out of which springs arise, is called the Earth's Crust.

The rocks of which this crust consist belong mostly to the Sedimentary series, a large number to the Organic series, and a smaller, but still considerable proportion, to the Igneous series.

PROOFS THAT PARTS OF THE CRUST HAVE SUNK DOWN

Submerged Forests, are to be regarded as evidence of subsidence of the earth's surface, just as the raised beaches are taken as proofs of upheaval.

The beds of coal, for example, which once flourished as green forests at the surface, are now found buried deep within the earth.

Two facts are now very clear to you about the crust of the earth—1st, it has often been pushed outward, so as to rise above the level of the sea; and 2d, it has also often sunk inward so as to carry parts of the land deep beneath the sea-level. But it could not undergo these movements without suffering other changes.

PROOFS THAT THE ROCKS OF THE EARTH'S CRUST HAVE BEEN TILTED, CRUMPLED, AND BROKEN

The crust of the earth, instead of being made of regular layers one above another, like the coats of an onion, has been so squeezed and fractured, that in many cases the bottom or oldest rocks have been pushed up far above the newest.

Wherever, therefore, strata are pushed up or let down more at one place than at another, without being actually broken across, they must be thrown into an inclined position. Now this unequal and irregular kind of movement has taken place many times in every quarter of the globe. If you look at the stratified rocks, in most parts of this and other countries, you will seldom find them quite flat—usually they are inclined, sometimes gently, sometimes steeply, so that they have not only been upheaved out of the sea, but have been moved irregularly and unequally.

THE ORIGIN OF MOUNTAINS

First of all, then, when any chain of mountains is examined it is found to be made of rocks belonging to one or more of the three great classes with which you are already acquainted. In particular, the great mass of most mountain chains consists of various kinds of stratified rocks—such as sandstones, conglomerates, limestones, and others. Now you have found that these rocks have been laid down under water, most of them under the sea. They often contain the remains of shells, corals, sea-urchins, or other marine creatures, and these remains may be taken out of the rocks even at the summits of the mountains. No clearer proof than this could be required to show that mountains are not so old as "the beginning of things," for these fossils prove that where the mountains now stand wide seas once rolled.

Again, mountains which consist of rocks formed originally under the sea must owe their existence to some force which could raise up the bed of the sea into high land. As a consequence of the slow cooling of our planet, its outer crust, under the enormous strain of contraction, has been forced up into ridges in different places, with wide sunken spaces between.

The ridges form mountain chains, while the sunken spaces are filled with the waters of the ocean. If you look at a map of the world you may trace out the principal lines of elevation, as they are called, over the globe.

HOW THE ROCKS OF THE CRUST TELL THE HISTORY OF THE EARTH

Geological history brings before us, in this way, many facts well calculated to impress our minds with the great antiquity of our planet, and with the marvellous chain of changes by which the present order of things has been brought about. We learn from it that mountains and valleys have not come suddenly into existence, such as we now see them, but have been formed gradually, by a long series of processes similar to those which are even now slowly doing the same work. We discover that every part of the land under our feet can yield us up its story, if we only know how to question it. And, strangest of all, we find that the races of plants and animals which now tenant land and sea are not the first or original races, but that they were preceded by others, these again by others still more remote. We see that there has been upon the earth a history of living things, as well as of dead matter. At the beginning of that wonderful history we detect traces merely of lowly forms, like the foraminifera of the Atlantic ooze. At the end we are brought face to face with man—thinking, working, restless man, battling steadily with the powers of nature, and overcoming them one by one, by learning how to obey the laws which direct them.

THE VALUE OF SCIENTIFIC KNOWLEDGE

It may occur to the reader to ask: "Of what *practical value* is information concerning geology, or any of the other sciences? How will such knowledge, unless I devote years to the acquirement of it, aid me in bettering my condition?"

Huxley, in one of his admirable essays, answered this question. He told of the formation of an English company for the mining of coal. The supposed vein lay beneath a certain formation of rock, yet every geologist in the world knew that coal could not be found below that stratum. Ignorance of this fact cost the investors a fortune.

PRINCIPLES OF PERSPECTIVE

THE word perspective means "seeing through," and indicates the fundamental principle of the arts of drawing and painting; furnishing the rules by which the artist is able to reproduce the appearance of natural scenery and several-sided objects upon a plane surface. Like every other subject in the arts and sciences, ability to apply the rules of perspective may be derived either from a naturally quick eye, trained by practice to correctly reproduce things seen, or it may be learned and understood by mastering certain geometrical rules, such as will enable the production of effects more technically correct.

GENERAL RULES AND PRACTICAL INSTRUCTIONS

IT is not necessary to enter into mathematical discussions which are seldom of practical advantage to artists. The principles of perspective may be readily understood by a few simple rules. Probably the most important principle is found in the method of tracing a landscape on a plane surface. Perfectly described, this consists simply in drawing the more distant objects smaller in size and somewhat above those represented to be close at hand. That this is the correct method may be readily verified by a simple experiment. If, for example, we look through a window at a landscape, we find that the objects further away literally appear to the eye higher up than those close at hand, as may be shown by holding a measuring rule perpendicular to the plane of vision. The same facts may be better observed with the reflection of a landscape in a looking-glass or on a screen of a photographic camera. Moreover, the objects seen in both cases are actually impressed upon a virtually plane surface—the retina of the eye—which is the exact prototype in nature of the camera obscura.

The illustration usually given for the practical demonstration of the first principles of perspective is to place a vertical plane, such as a transparent screen of glass, between the observer and the object seen. Now, although the observer and the object are actually on the same ground plane, or level, the object seen by him will appear to be standing in an elevated position on the picture plane, with the intervening distance of ground plane between him and it rising to its level. The explanation of this fact is readily obtained when we consider that the rays of light converging at the pupil of the eye really form a sort of imaginary cone, constantly increasing in diameter and having its apex at the eye.

DISTORTION OF OBJECTS

Objects of perfectly rectangular shape, when viewed at an oblique angle, appear to taper rapidly toward the horizon in the

picture. Thus, a house, whose sides are perfectly rectangular, and the peak of whose roof is perfectly horizontal to the plane of the ground, if viewed from a point at such an angle to one of its corners that two sides may be seen, should be drawn in a picture with the base line rising from the corner nearest to the ob-

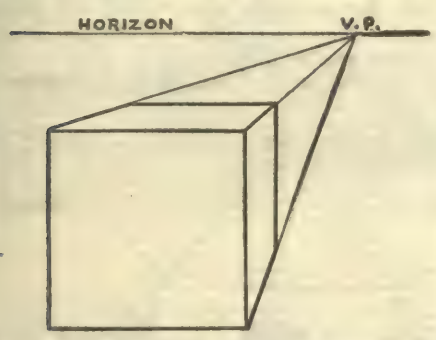


Diagram of Perspective, showing the distortion of a rectangular object viewed from above

server, with the line of the base inclining almost as rapidly toward this, and that of the eaves inclining at a somewhat more gradual angle. If, now, we extend the three lines just mentioned so that they meet, we will have in a drawing of the level landscape the approximate position of the line of the horizon.

Of course, the angles of variation from the horizontal in such cases vary with the height of the building and its position in the picture. Correct inclination of such lines, however, is largely a matter of judgment and experience. By remembering that the base line and peak line of an object, like a building, must be drawn so that, if extended, they would meet at the horizon, the true effect can be readily obtained. Should we draw the base line and peak line parallel, the building would appear to be going up or down hill, as the case might be, or the effect of showing two sides would be lost. The rules applicable to drawing the lines of buildings apply also to the drawing of other parallel lines, as, for example, the rails of a railroad track or the two sides of a street. If we stand at the end of a long street, or in the centre of a railway track that extends beyond the horizon, the parallel lines on either side will apparently come closer together, and, if the landscape is a level one, they will apparently meet at the point furthest from the eye. This point is at the horizon and is called the "vanishing point." In speaking of landscapes the word "horizon" is used to indicate the line limiting vision, beyond which nothing can be seen. The best example of this may be seen in a view looking out directly upon the ocean or upon a perfectly level prairie of wide extent. In drawing such views as these, the line of the horizon should be placed at a point which the eye judges to be directly opposite to its line of vision. This is above the base of the picture, which is the theoretical ground plane on which the observer stands. But it is somewhat below the point at which it should be, supposedly, if intervening distances were actually considered; since, according to the theory of the picture plane previously explained, the object of vision appears to be raised above the ground plane on the one hand, and somewhat lower than the sky line on the other, by virtue of

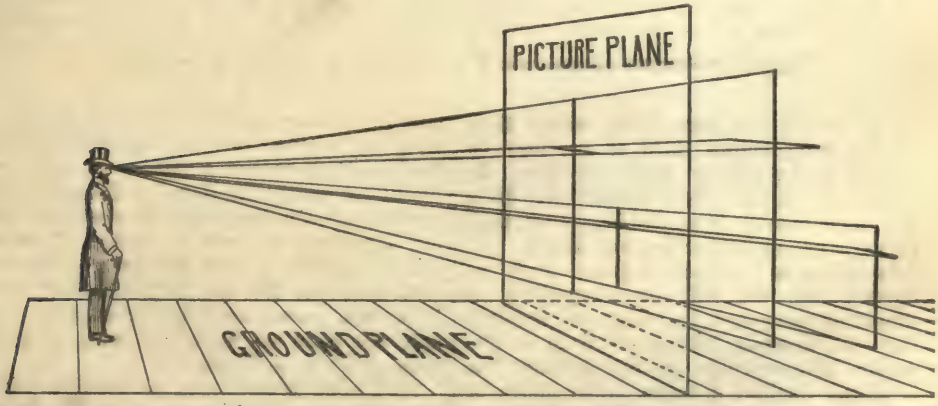


Diagram illustrating the theory of the picture plane, and the principles of perspective in drawing and painting

the fact that the lines of vision, converging at the eye, are actually nearer together at the picture plane than at the object of vision.

Other principles of perspective are readily understood from the foregoing principles as well as from ordinary experience.

Thus, for example, it is familiar to any observer that the top of an object, viewed from above at an oblique angle, must be drawn more or less elliptical, if round, and more or less trapezoidal, if square. That these methods reproduce the objects preing a very tall house, but slightly removed from the theoretical position of the observer, the line of the peak should incline very rapidly toward the horizon, while that of the base would incline more gradually. Similarly, when such an object is further removed from the observer or viewed from a somewhat elevated position, the conditions are rapidly reversed, until the base line inclines more rapidly than that of the peak. This fact is also illustrated in the accompanying diagrams.

Probably one of the most effective meth-

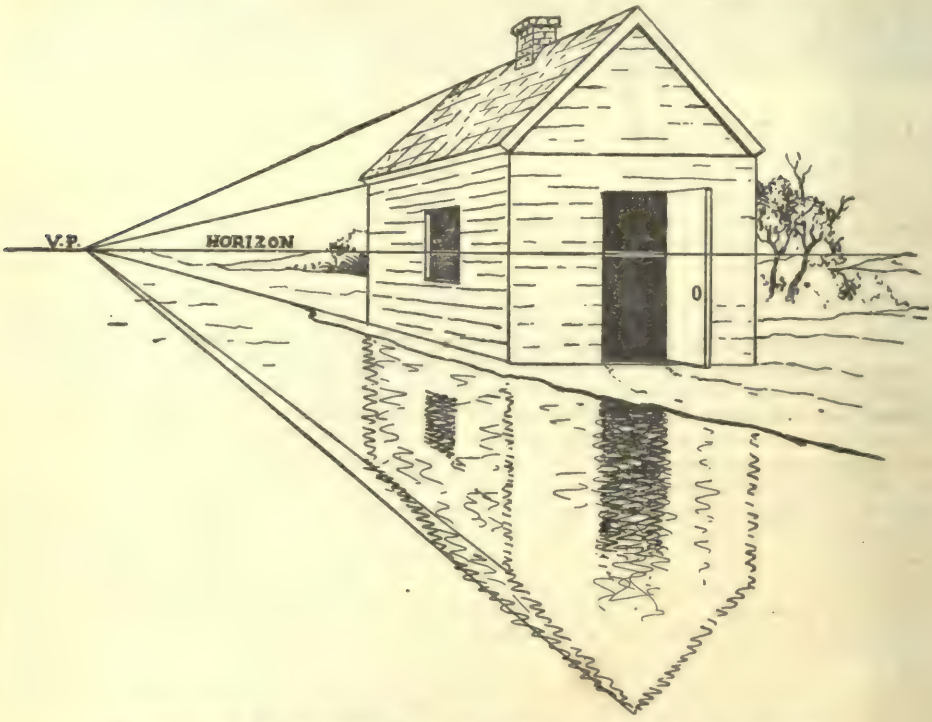


Diagram showing the perspective of a building, with drop of lines to the horizon

cisely as the eye sees them, rather than as the mind knows them to be, may be readily discovered by departing from the rules laid down. The picture we draw will then appear as something other than either a cylindrical or cubical object.

In drawing cubical objects, such as houses, etc., the rule of perspective, as shown by accompanying diagrams, involves that the greatest inclination from a line drawn perpendicular to the ground line is at the furthest distance, either above or below the plane of vision. Thus, in drawods for mastering the details of perspective, as applied to the reproduction of landscapes, is to use a camera obscura, by means of which the lines of distances are reproduced for the artist precisely as the eye sees them to exist in nature. Considerable experience with the camera obscura will accustom the eye to the correct outlines and proportions, and eventually enable the hand to reproduce them without such artificial assistance.

As a good general rule, geometrical principles and laws of lines and angles are of

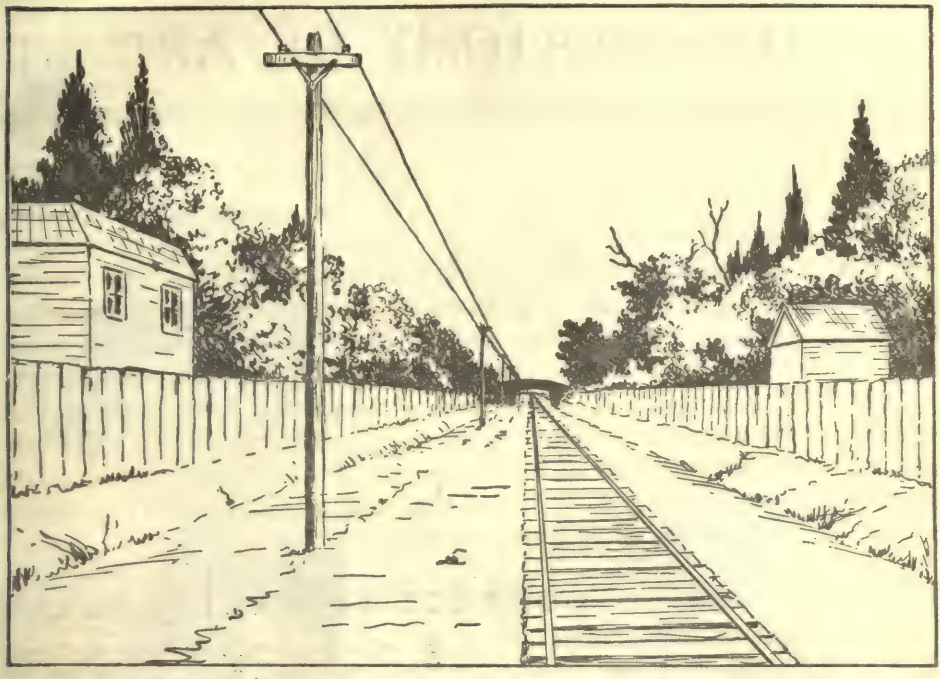


Diagram showing the drop of parallel lines to the horizon, as shown with a railway track, telegraph lines, and fences

very little use to artists in the production of landscapes and general views. The great object to be obtained is to train the eye to see correctly and the hand to reproduce exactly. Of course, in the work of drawing a city street, the outside of a building, or the interior of a room, considerable measuring must be done in order to obtain correct results; but, without adequate drawing of the eye and hand, such measurements are of little account.

In drawing many objects involving a considerable number of lines, such as a building, a very ready and helpful method of obtaining correct proportions is to employ the following simple device. Tie a string around a pencil or other straight stick and hold the string between the teeth at a certain point indicated by a knot which is tied after the desired proportions of the nearest lines have been obtained. Proportionate lengths of all other lines may then be obtained by stretching the string held between the teeth, marking the points of the figure to which it extends above the points to which the string is tied. This, correctly measured off on paper, will give the true proportions in every case.

THE ANATOMY OF ART

WHILE in the work of drawing natural scenery, landscapes, buildings, etc., the artist needs to understand the laws of perspective, as explained in the preceding article, the work of correctly drawing human and animal figures demands a very certain and definite knowledge of anatomy and of the proportions of the various parts of the body. Correctly speaking, human beings and animals are not drawn in perspective. Should this be attempted the results would be about the same order of distortion as is found in photographs of people and animals taken with the subject so posed as to bring the parts into different planes. The correct procedure with figures of human beings is to draw the various parts as the mind knows them to be, rather than the laws of perspective, rigidly applied, might compel us to represent them.

PRINCIPLES OF CORRECT FIGURE DRAWING

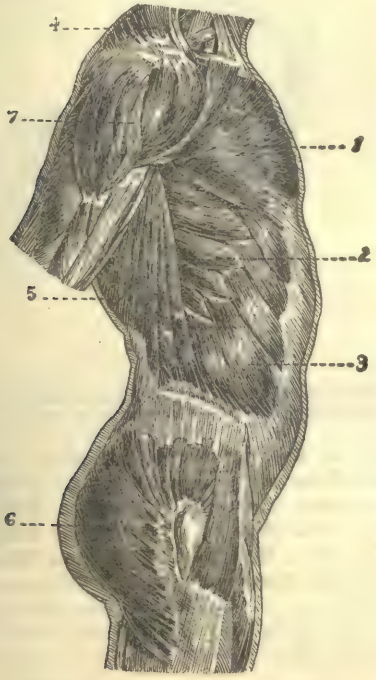
GENERAL PROPORTIONS

WHILE the end of correctly drawing a living being is in many respects like that of drawing any other objects, natural or artificial, requiring particularly such training of the eye and hand as shall enable correct using and perfect reproduction of what is seen, there are certain laws of proportion, especially those applying to the human figure, which must be thoroughly understood and applied. For example, many youthful artists attempt to draw the human face, and while, on account of certain natural aptitudes, they can perhaps produce a good likeness, the relative proportions of the various features seem so utterly incorrect that the effect is marred. This is due to the fact that the artist has not mastered the fundamental rules for drawing the face. Although there are numerous variations in the proportions of the face, as in other parts of the body, it may be generally assumed that a face, measured from the tip of the chin to the upper edge of the forehead, may be divided into three equal parts. These are measured from below, from the tip of the chin to the point of the nose, and from thence to the edge of the forehead. These measurements, of course, give the ideal human face, but knowledge of the rule will enable the artist to speedily discern and reproduce any variations occurring in particular subjects.

A similarly general rule makes the length of the human hand, measured from the end of the palm to the tip of the middle finger, exactly the same as the length of the face just given. Some persons and races have the hands somewhat longer than this measure; others have them shorter; but the rule applies to well-formed representatives of European nations. A general rule for the length of a human figure is eight heads—measured from the tip of the chin to the top of the skull, not including the hair—for persons above the average height. For persons of average height, or below, the most approved proportions give seven and one-half heads from the base of the heel to the top of the cranium. While, on the basis of the eight-head measurement, the exact centre of the body is at the pubic bone for representatives of both sexes; with many figures below medium height, the centre is set up higher on account of the shortness of the lower limbs. Such variations need not be considered, however, as the aim of the artist is to reproduce the ideal and normal, rather than the accidental variations occasionally occurring in real life. Another rule of proportions followed by the ancient Egyptians is to make the total height nineteen times the length of the middle finger; but this rule also is rather ideal than invariable, although it may be regarded as approximate for the large ma-

jority of figures. It is useful also in determining the correct size of the hand in any given figure, since the middle finger is approximately one-half the total length of the hand.

The approximate length of the arm in normal male figures is about three and one-



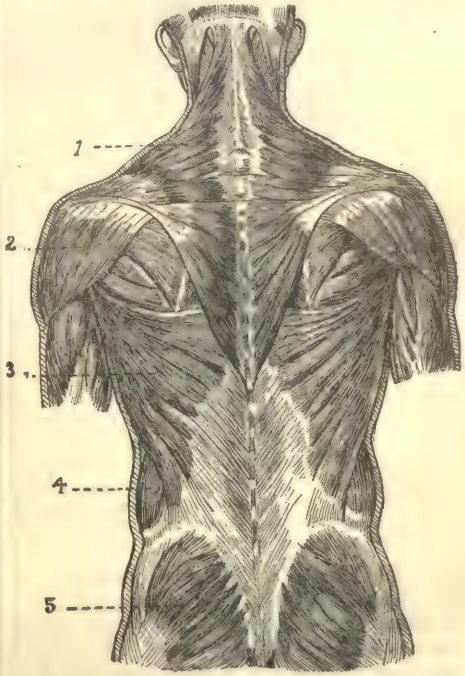
The important muscles of the trunk—side view: pectoralis major (1); serratus magnus (2); great oblique (3); trapezius (4); dorsalis magnus (5); gluteus maximus (6); deltoid (7).

half heads from the tip of the middle finger to the point of the shoulder-blade. With the average female figure, the length of the arm similarly measured is nearly three and three-quarter heads, being proportionately longer than in the average male. The length of the leg is approximately the same in both sexes, measuring about four heads from the tip of the heel to the point of the femur, which is approximately on the line with the pubic bone. The exact centre of the lower limbs goes just below the patella or knee-cap.

PHYSICAL CONFORMATIONS

Next to understanding the general proportions and relative lengths of the various parts of the body the artist should understand at least the general outlines of conformation, in order to draw a figure true to life. It is not sufficient that the correct proportions be observed: he must know the exact outlines and shapes of the various parts. Knowledge of this subject can come only from study of anatomy, which acquaints the student at least with the location and extent of the various muscles, as well as with the uses for which they are intended. It is necessary that the artist understand the uses of the various muscles, because in attempting to draw a figure in action, as, for example, one with the arm raised, he must know precisely what muscles are in action and should be emphasized. As this matter requires exact study, it will be possible only to point out the more important facts connected with the muscles of the body and several limbs.

Muscles of the Trunk.—In beginning the study of the muscles with the trunk,

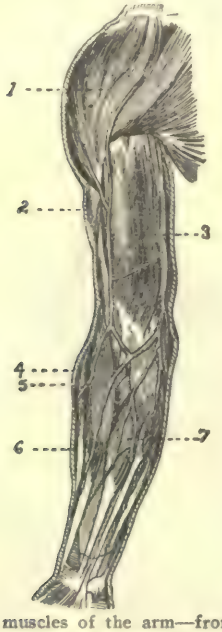


The important muscles of the trunk—rear view: trapezius (1); deltoid (2); latissimus dorsi (3); great oblique (4); gluteus maximus (5).

or body, we find that the most prominent, and, consequently, the ones most liable to appear with a figure in action, are the Great Pectoral Muscles, which are attached to the internal edge of the clavicle, and in front of the sternum and to several of the ribs, and, at the other hand, to the

bicipital groove of the humerus. Directly beneath the Great Pectoral Muscle is the Serratus Magnus, apparently running in the direction of the ribs, interlaced by several branches of the Great Oblique Muscle, which arises from the front half of the Ileum to the lower edges of the seven or eight last ribs. Both these muscles, particularly the former, are very prominent in well-developed athletes, and their conformation and location should be carefully studied.

The most prominent muscles at the back of the trunk are the Latissimus Dorsi, which rises on either side from the attachments at the six or seven last dorsal vertebræ,



Important muscles of the arm—front view: deltoid (1); triceps (2); biceps (3); first radial extensor (4); supinator longus (5); second radial extensor (6); great palmar (7).

and the lumbar and sacral vertebræ, to the bicipital groove of the humerus. Its function is to carry the arm near to the body downward and backward. Above and superimposed on the last-named muscle, is that known as the Trapezium, which is attached to the spines of almost all the cervical, and sometimes all the dorsal, vertebræ, on the one side, and, to the edge of the scapula, acromion, and clavicle on the other. Its functions are to lower and elevate the shoulders or to incline the head backward.

Muscles of the Arm.—In drawing the arm with anatomical correctness the principal points to be observed are the Deltoid Muscle, which is a nearly triangular mass attached to the clavicle and shoulder-blade, on the one hand, and to the humerus on the other. It is fixed so that the Great Pectoral Muscle, in front of the Latissimus



A well-developed arm, showing the deltoid, triceps, biceps, extensor, and abductor muscles.

Dorsi in the rear, are both attached to the humerus at points beneath it. Its function is to raise the arm so that the humerus shall stand at right angles to the trunk.

The most important muscles of the humerus are the biceps, at the top, and the triceps, at the bottom, of the arm; the former having as its object to raise the forearm, and the second to draw it straight

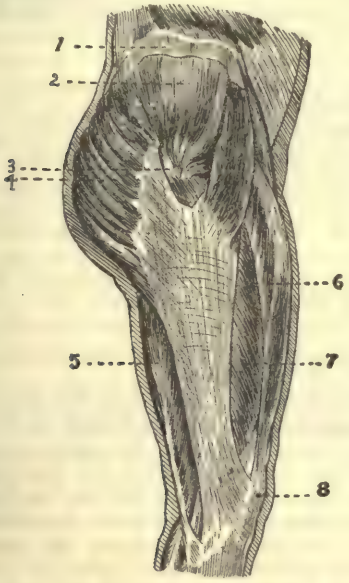


A well-developed arm, showing the muscles that appear most prominent in the position assumed.

again. Similarly the most important muscles of the forearm are the Supinator, at the top, and the Extensor muscles at the lower sides of these. The former is contracted, and becomes apparent when hand

is clinched; the latter, when the fingers are extended. Taking these five muscles into consideration, the outer appearance of the human arm may be very well outlined.

Muscles of the Leg.—The shape of the lower limb is largely determined by the conformation of several large muscles, which



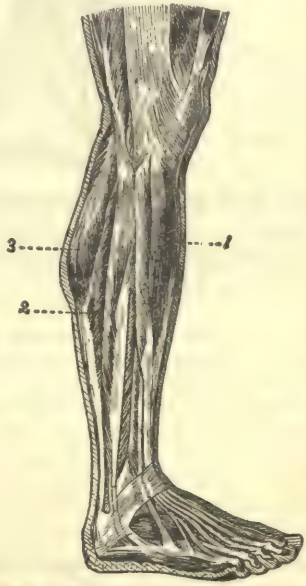
Important abdominal and femoral muscles, etc.: iliac crest (1); aponeurosis (2); great trochanter (3); gluteus maximus (4); biceps (5); rectus anticus (6); triceps (7); patella (8). The large ligament is the tensor muscle of the aponeurosis fasciæ latæ.

are made prominent when brought into action. To the rear of the femur and attached to the thigh-bone is the Biceps or Flexor Muscle, whose duty it is to turn the leg outward. Superimposed upon this, and on the outer side of the femur, is the Triceps Muscle, which is brought into action on the bending of the knee. To the top and front of the femur is the large muscle, known as the Rectus Anticus, whose function is to straighten the leg.

On the lower half of the lower limb the most important muscle is the Soleus, which is attached at the top to the posterior part of the head of the fibula and to the nearer edge of the tibia, on the one hand, and through the great tendon of Achilles to the calcaneum or heel, on the other. This muscle, which forms the "calf" of the leg, as it is called, has as its function to extend the foot. To the front of the lower half of the leg is the muscle known as Tibialis Anticus, which arises from the outer side of the head of the tibia, on the one hand, and passes over the cuneiform bone to the great toe. Its function is to bend the foot inward and upward.

Muscles of the Neck.—The principal muscles of the neck that must be considered in artistic work are the Sterno-Cleido Mastoids, which attach to the skull directly behind the ears, and, running downward and forward, connect to the interior of the collar-bone and sternum. The function of these muscles is to turn the head from one side to the other, when one of them acts alone, or to bend the head forward toward the chest, when both act together. Although they are seldom very prominent, except in subjects having a thin or muscular neck, they must be carefully considered in drawing a correct outline of the throat, particularly with the head inclined sidewise or in an oblique position.

Above and forward of the Sterno-Mastoid Muscles, we have, on either side, that known as Platysma Myoides which is attached to

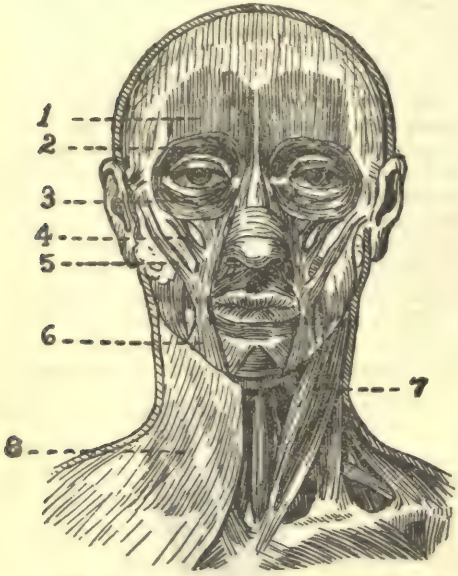


The important muscles of the lower limb: tibialis anticus (1); soleus and tendon of Achilles (2); gastrocnemii (3).

the jaw-bone almost from the chin to the hinge, and, at the lower extremity, arises from the fascia covering the upper part of the Deltoid and Pectoral Muscles. This muscle is a very thin sheet of fibres and is seldom apparent on the surface, except in aged people. Its principal function, so

far as concerns the artistic significance of the anatomy, is to depress the corners of the mouth, thus increasing the expression of melancholy.

THE MUSCLES OF THE FACE, while not appearing so strongly on the surface as those of the limbs and trunk, are nearly the most important to the artist. This is true



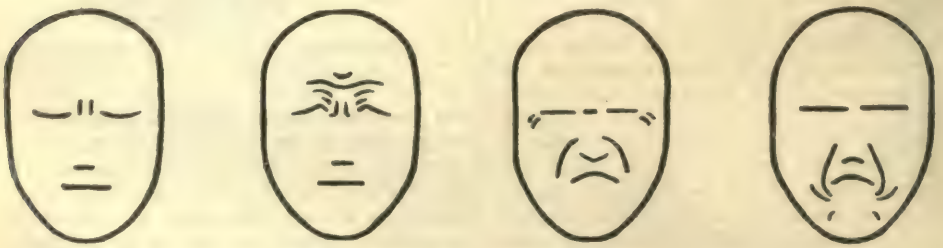
The muscles of the face and neck: the occipito-frontalis (1); the orbicular of the eyelids (2); the common elevator of nose and upper lip (3); smaller zygomatic (4); larger zygomatic (5); triangular of the chin (6); sterno-cleido mastoid (7); latissimus colli (8).

because, by the use of these muscles, the various expressions of the human face are made. In order, therefore, to correctly reproduce the exact expression we may have in mind, it is necessary to know what muscles are active in producing it. The most important muscles of the face are the Occipito-Frontalis, having its origin at the point of the forehead and its insertion above the Orbicular Muscles of the eyelids, so as to effect the elevation of the eyebrows, as in expressions of astonishment, etc., by which the forehead is wrinkled. The Orbicular Muscles, being circular in shape, contract with the effect of depressing the eyebrows, producing a vertical angle above the bridge of the nose. This gives the expressions of perplexity, reflection, etc.

The first muscle attached to the mouth is the Zygomatic, which has its origin in the neighborhood of the chin-bone and its insertion at the corners of the mouth. Its principal function is to draw up the corners of the lips, thus producing the expression of laughter and smiling. It also has the effect of elevating the muscles of the face on either side, so as to strongly accentuate the naso-labial lines, and to draw them up toward the cheek-bone; also producing in some places the radiating folds of the corners of the eye known as "crow's-feet."

Another muscle, known as the Smaller Zygomatic, attaches to the mouth on either side at a point nearer the centre of the lips; thus acting to draw up the centre rather than the ends of the lips, and producing the expression of grief, disgust, and similar sentiments; also being the muscle brought prominently into action in weeping. This muscle, acting with the so-called Common Elevator of the lips and nose, accentuates the expression of grief, giving the expression of despair or abandoned sorrow.

Another muscle of considerable importance in the expressions of the face is the so-called Triangular Muscle of the chin, which has its attachment below the lower lips on either side. It operates to depress the corners of the mouth, thus producing the expression of contempt, discontent, etc., usually accompanied by a pursing of the lips at the centre and a strong tension on the naso-labial lines.



MEDITATION SORROW GRIEF CONTEMPT

PAINTING

LANDSCAPE painting is comparatively a modern art. Titian, who lived in the sixteenth century, is generally looked upon as its founder. By landscape painting one means the representation of natural scenery for its own sake. Now, of course, long before Titian, you find painters painting sky, and sea, and mountains, and trees, and painting them with extreme beauty and skill. But you will not find a single instance among the early Italians of a picture existing wholly or primarily for the sake of its landscape. Nay, more than this; you will find scarcely an instance in which the landscape is much more than a beautifully designed surrounding for figures; a surrounding founded indeed upon love and observation of nature, but painted primarily for exactly the same reason as still earlier the gold pattern backgrounds were painted—that is to say, simply as a beautifully designed surrounding for figures. Titian commenced a new order. Natural scenery had for him a meaning and a fascination in itself apart from human beings. And so Titian commenced the modern art of landscape; the art with which we connect the great names of Holbein and Ruysdale and Gaspar Poussin, and Crowe and Courdette and Turner. These men and their followers rejoiced in natural scenery purely for its own beauties, and tried to represent it as they saw it under its different aspects; they tried, as we may say, to give portraits of it, to give its genuine effect; they did not use it simply as material from which to work out beautiful designs; but they went to it that they might know its appearance, and bear record of that. And this is true landscape painting.

It is a matter of wonder that the art of landscape painting, which is now so popular, should have been such a late development of art! The answer to that question would lead us probably into a somewhat difficult discussion hardly suited to these pages. But we may say this—in early times, nature, as we call it, was not rejoiced in by the people as it is nowadays, because it was for them full of known or dreaded perils, and they cared neither to visit it nor to look at its representation. Many of these perils were real, such, for instance, as those of a robber or a wild beast; some were imaginary, such as those from supernatural beings. If every time you went up to a mountain you were in dread of meeting a spirit, and every time you went into a forest you were in dread of meeting a robber or a wild beast, you would not much care about going up moun-

tains or into forests, nor would you care about paintings of these dreadful places. But by and by civilization increased, superstition passed away, people came to be more and more at their ease with nature, and able to gaze on her with enjoyment.

PRACTICAL INSTRUCTIONS FOR LANDSCAPE PAINTING

TECHNIQUE.—The first business of a student is to learn how to reproduce with exactness the scene before him or her. When you go out to draw, determine that you will do your best to match the colors and the tones of the landscape as nearly as ever you can. Do not be content with imperfect knowledge and resources. Do not try to make pretty pictures; endeavor simply to make a study which shall be like the thing before you. By and by you will get command over your materials, and then it will be time enough to commence painting pictures. But over your materials get command as soon as ever you can. Grudge no time or trouble which helps you on with this. Learn how to do whatever you want to do, to imitate whatever you want to imitate; this is studentship, and do not shirk it.

DETAIL; MASS; TONE.—The great difficulty which most people find when they begin landscape painting from nature arises from detail. Detail is a terrible task. Let us by way of illustration try and imagine some simple scene. Supposing, then, we want to paint—shall we say a cottage, with some trees in the background, and in front a stream in which they are reflected. Now, in the trees there will be visible innumerable leaves, no doubt, and branches, and variations of color. In the roof it is perfectly certain that there will be a thousand tints, and in the walls a thousand streaks and reflected lights and tones; and then all this more or less over again in the water with increased intricacy.

Most amateurs, when they sit down to paint such a thing, begin trying bit by bit to copy each leaf and twig, and tile and stain. One knows so well the result—a thin, toneless, unproportional drawing, that has no true art-value whatever. Well, the first thing is to forget absolutely all detail, and to aim simply at mass and tone; to aim simply at getting down a groundwork of the general color, which shall be true in its broad relation of light and dark, and of tint. Into this you may work any amount of detail you choose; but unless you have got this, all detail is worthless, and when you have gotten it, when your tone, acquired by broad relation of light and dark and of tint, is true, even supposing that you carry the drawing no further, it has real value as a representation of the scene and as a piece of art.

You will find it an excellent plan at the commencement of a drawing to half-close your eyes as you look at the landscape; in this way you will shut out all detail and will see the scene before you as a whole; you will see it in its broad relations, that is, of light and dark, and of tint. It is exceedingly useful, too, when you have the time, to first of all make a pencil sketch of the scene on the same principle, attending, that is, wholly to masses and tone. You will get these down rightly with greater ease, because you will not have to be thinking yet of what the colors are and have to match them. When you have got your black and white study correct—using your pencil, we should advise you, as one uses charcoal, rubbing it, that is, with your finger—then on a new piece of paper begin coloring, keeping the pencil study by you as your scheme of mass and tone.

BLOCKS; BODY COLOR; INK; COLORS.—Unless you have a long while before you, and can return to your subject again and again, so as to work it carefully out, we advise you not to make your landscape studies too large. For a morning's or an afternoon's work, a block the size of a piece of notepaper folded out, or even of a piece of notepaper folded in two, as we ordinarily write on it, is large enough. Paint on white paper, and on white paper that has a tolerable but not too rough grain. You will find it useful to use body-color with a fair-sized brush, and in a fluid state, when you are commencing your drawing, when you are getting in the broad relation of light and dark, and of tint. Into the body-color, while it is still fluid, work different tints more or less pure as you want them; then, when the groundwork is dry, draw into it the main form, with a pen charged with indelible brown ink, and then work on toward finishing with pure colors. You need

not in this way fear that your drawing will look chalky; it will not in the least, if you work your pure colors in with tolerable skill. And as for the brown pen-lines, also, they will disappear if you like to work on them enough.

As to colors, it is well to have a moderate number only in one's box. The following list will serve you for painting most ordinary landscapes. Raw Umber, Burned Sienna, Raw Sienna, Light Red, Rose Madder, Brown Madder, Aureolin, Cobalt Blue, Viridian, Olive Green, Black and Chinese White. Every artist, of course, has special colors that he or she is fond of, just as he or she has special methods; but with these colors you will be able to do most of what you find to do as soon as you get a tolerable facility in combining them.

SKETCHING.—Amateurs are exceedingly fond of what they call sketching. We all know what that generally comes to—going out and choosing some large piece of landscape, and then making nonsense of it; spoiling a piece of paper with something which has no drawing, no tone, no color, but which is purely rubbish. Fly from the temptation to sketch as you would fly from the Evil One himself. If you do not really feel that you can muster energy enough to learn how to draw and how to color, do not set your hand to the business at all. But if you do, go to nature and to the masters, reverently continuing, and try to let this witchery work on you, grudging no pains or no sacrifice. You may not do great things, but if you have any true art instinct at all you will in time do some beautiful things, things which, however small and quiet, it is well to do; they will bring you happiness, and they will bring some others, of whom it is worth thinking, happiness also.

PAINTING ON TERRA COTTA

In painting on terra cotta it is best to treat your whole subject, first of all, in light and shade, with white enamel, using it thinly for the shadows, and thickly in the light. As the unglazed pottery is more absorbent than the glazed, more oil is required in the enamel when used for this purpose than for ordinary work. Remember that the brush must never be filled with enamel, but take as much on the tip as it will hold, and you will begin to replenish it for every brush-mark. It will not be found at all easy to do this well, as white enamel is difficult to lay on cleanly and smoothly, until the student has had a good deal of practice. When the whole design has been painted in this manner, it must be fired, and then, if the white has been put on sufficiently thick, the design will be glazed. You may then tint it with the ordinary china-painting colors and have it re-fired.

The chief difficulty in painting on terra cotta will be overcome if your subject is well chosen. Let the flowers be of a simple, open nature, such as daisies, hawthorn, blackthorn, wild roses, any sort of fruit blossoms, buttercups, or primroses. Any of those, and many others, are very appropriate, and look well; but if the student has chosen anything of a bell-shaped nature, or, more still, anything elaborate, such as columbine or antirhinium, success will be most difficult of attainment.

Colors should be very subdued on terra cotta: Pale Yellows, White, Dull Greens, and Browns all look well, with possibly a little Turquoise Blue. It is best for the student not to paint on terra cotta until he can conscientiously assure himself that his taste is well trained, and his manipulations good.

It is quite allowable to mix color with the enamel for the first firing, but there is no advantage in doing so, as the enamel makes too rough a surface for shading upon, and it therefore requires a second firing before it can be finished. If, however, for anything very simple, you would like to try it, let the proportions be about four of enamel to one of color.

Colored glazed plates and tiles may also be painted in the manner described for terra cotta. Beautiful shades are to be had of Celadon, Chocolate, Orange, Blue, Green, and others.

PAINTING ON CHINA

In commencing the study of China Painting it will be well if the student starts with the firm determination of completely mastering the use of his materials. And even though he may be proficient in oils or water colors, the *technique* is so different that it will be necessary to begin at the very beginning.

If the student knows nothing of pottery painting, by all means let him begin with over-glaze in preference to under-glaze painting. In the former, all faults (for instance, brush marks, inefficient dabbling, the use of too much turpentine, too much or too little oil) are apparent on the surface. They are only too visible the instant they are perpetrated. There is seen to be something obviously wrong, and if the stu-

dent does not know how to remedy it, he feels, if he is a conscientious worker, that the least he can do is to take it out, and hope for more skill in a second attempt. But in under-glaze painting, work often has the appearance of being very tolerably well done until it is glazed and fired, when brush marks, bad edges, and harsh lines start forth in a manner that is most unexpected and disappointing.

We shall confine our attention entirely to over-glaze painting, and throughout it must be remembered that the colors mentioned are invariably over-glaze or manual colors. Enamel colors should be kept carefully apart from under-glaze colors, as the smallest grain of the latter mixed with the former would completely spoil the effect. The same remark applies to oil paints, and even to the turpentine in which brushes used for them have been rinsed.

In choosing your earthenware or china, notice that the glaze is smooth and even, without specks of any sort, and not crazed, *i.e.* requiring either a greater or less degree of heat in order to fuse it.

The following implements and colors are absolutely necessary. Those contained in the supplementary list will be found a great convenience after some progress has been made:

1 Steel Palette Knife.
1 Glass Muller.
1 Hand Rest.
1 Medium-sized Dabber.
1 Small Dabber in Quill.
1 Sable Crow Writer.
1 Plate (glazed).
2 or 3 sizes of Camel's-Hair Brushes for China Painting.
Several 6-inch or 8-inch Tiles (also glazed) to be used for Palettes.
Turpentine.
Fat Oil of Turpentine.
Spirits of Lavender, or Oil of Cloves.

MOIST WATER COLORS

Deep Azure Blue.	Outremer Turquoise.
German Brown.	Olive Brown.
Brunswick Brown.	Sepia.
Vandyke Brown.	Deep Black.
Gray Black.	Carmine.
Royal Purple.	Deep Green.
Rose-leaf Green.	Light Sèvres.
Dark Orange.	Pearl Gray.
Red.	Persian Yellow.
Strong Yellow.	White Enamel.
China Meglip.	

DRY COLORS

FOR BEGINNERS

Rouge Orangé.	Violet de Fer.
Noir d'Ivoire.	Bleu Riche.
Carmine No. 2.	Pourpre Riche.
Gris Perle.	Jaune Orangé.
Ocre.	Brun No. 4.
Vert Chrome Riche.	Vert Brun.
Vert Noir.	White Chrome (English).

SUPPLEMENTARY LIST

FOR THE MORE ADVANCED STUDENT

Jaune à Mêler.	Rouge Chair No. 1.
Vert Bleu Riche.	Carmine No. 3.
Brun No. 3.	Evan's Brown.
Ivory Palette.	Knife.

All the colors mentioned in the list will work freely together, with the exception of Brunswick Brown and Red, which will, however, mix together, and with black and purple, but not with the other colors. Working with the moist water colors will be found very pleasant.

In sketching, use the crayon purchased for that purpose, which, being of an oily nature, will not be washed out by the water-color passing over it. It will, however, disappear completely in the firing. The manner of working is very much the same as if the colors were mixed with oil. The brush must be kept square, and the mark of color may be retouched again and again in order to make it smooth. If a large space is to be covered, use the dabber. More water or meglip must be added as occasion requires; but too much of the former is apt to produce a very worky appearance, and if too much of the latter is used the color will take a long time to dry. For a broad sweep of color, a combination of the two is best. When the ground is laid, and your drawing is of such a nature that you have been obliged to take the color over it, you may clean out your design with great ease, by merely washing away the surplus color with a brush just moistened with water, but care must be taken that the brush is not too wet, lest the work shall be made messy. The pattern may also be cleaned out either with a penknife or with the pointed end of a brush-handle. These colors are perfectly well ground and free from grit. One of the few technical difficulties connected with their use will be overcome if the student will *never* try to shade his work without drying the first washes at the fire. When these colors are dry they are easy to work upon, but we can

not sufficiently impress upon the student that they will not dry of their own accord. If the underworks are disturbed, it will show that these remarks have not been attended to.

With reference to the French colors, it must be borne in mind that the Iron Reds (all Reds of a brick-dust shade) will mix with each other, or with Black or Violet de Fer, and, to a moderate extent, with Jaune à Mêler, or Jaune d'Ivoire, but not with other colors. If mixed with Carmine, Blue, etc., and fired, the Red would all disappear. However, if a little thought is bestowed on the subject, this is no very great disadvantage, as by using Jaune à Mêler as a sort of go-between, you may blend or graduate Red into almost any other color you wish. Say, for example, that you desire to shade Red into Green; a good Green for the purpose can be made with Noir d'Ivoire and Jaune à Mêler, both of which colors will mix with Red. Or if a brighter Green is required, put plenty of oil into your Jaune à Mêler, and, with different brushes, wash the Red on to one end of the space to be covered, and the Green on to the other, blending them with Jaune à Mêler in the middle. If well done, the effect should be smooth and the gradation uniform; but if you use too little oil, the colors will join with a harsh line. Ochre is useful for shading Yellow, or, used by itself, for the warm glow in a sunset sky; but it will not mix at all satisfactorily with Greens. All the other colors will mix freely together; but after a little experience you will find that Browns are very apt to fire out, *i.e.* to disappear in the firing, leaving the other color with which they were mixed somewhat of the same tone as if it had been used pure; you will also find that Blues, Purples, and Carmines are very strong in their effect, being apt, when mixed with other colors, to show more after they are fired than before. White Enamel is most useful for little touches of white, or for painting on terra cotta. It must be kept scrupulously clean, and a separate palette should be reserved for it, a glass one being preferable to an ordinary tile. Then grind it with a steel knife, but use a glass muller or ivory palette-knife, otherwise it will probably be discolored in firing. If in painting with Enamel you find it is inclined to spread, breathe into the color on your palette, at the same time mixing it with a little more turpentine. As you require to put it on rather thickly, do not use too much oil.

The hand-rest, if placed over your work, for your hand to rest on while painting, will greatly help you to avoid rubbing or scratching your work, to which beginners are very prone. It will also assist you to acquire a light touch. A tall easel is a convenience, as it will save much stooping, and you can also see the general effect of your work better when it is not flat on the table.

If you have any facility in drawing we recommend you to sketch your work with Indian Ink, *water-color* carmine, or smoke; and if with the first, let it be of the first quality, or there may be impurities in it which will remain after firing. If the last is used, it is merely necessary to hold a saucer or tile over the flame of a candle, and then use the carbon while it collects with a little turpentine. If your design is very elaborate and you wish to trace it, you may do so by making use of either of the following methods. First, and least objectionable, is the process known as "pouncing." Arrange a piece of tracing-paper over your design, and with a fine hard pencil make a careful outline of your drawing.

When this is complete, place it on a cushion or anything soft, and with a fine needle, prick along every line. Finally, arrange your tracing on your plate, secure it at the corners with a wafer, and dust over it with a little black-lead or fine charcoal powder. The drawing will by this means be transferred to your plate in a series of dotted lines. It is then ready to be sketched with India Ink. Afterward remove all the dust with a soft brush or cloth, or it may interfere with your painting.

The second process is to place a sheet of black tracing-paper on the china, and over it your tracing; then go over all the lines again with a hard, fine-pointed pencil, or the sharp end of a porcupine quill. The patterns so transferred to the china should be strengthened and corrected with a fine brush and India Ink. The process is quicker, but it is also dirtier, and you are more likely to lose the delicacy of your drawing, although in simple conventional borders there is no objection to this method being used. As the great advantage which amateurs possess over professional china painters is the power of spending unlimited time over the smallest piece of work, they should never run the risk of spoiling their painting by using inferior methods.

SCULPTURE MODELLING

ANY ONE starting for the first time as a sculptor must be struck by the extreme simplicity of the material and the ease with which the rudiments of the art are to be learned. A lump of soft clay, a board to put it upon, and a few wooden tools of most simple shapes —these, and a bit of sponge, and your own fingers are really all that is necessary to produce a result. When the result has been attained, and the work has been modelled, then no doubt there are a few things to learn to enable you to transpose your work—which now exists in soft material—into a hard and more durable substance, either into stone, plaster, or terra cotta. There is no good in disguising the fact that to carve properly, a strong arm and a firm grasp are required, and that is not consistent with a woman's more delicate frame. She may console herself, though, with the reflection that there are many man sculptors who do not do their own carving, so she will not be exceptional if she employs help to perform that part for which she is not fitted.

In earlier days it would have been almost impossible for ladies to take up the profession of a sculptor, as we have reason to believe that the clay model was much less depended upon, the statue in marble being worked from small sketches or models, and not so elaborately pointed up, or so dependent for its general form upon mechanism as now. With all this great difference it is still a pity for a man who is able not to carve or finish his marble work himself, and in fact our best work has been produced by the sculptor's own chisel; it is, however, considered legitimate help, and a lady would be justified in employing assistance in that branch of the art.

PRACTICAL INSTRUCTIONS

DIFFICULTIES IN MODELLING.—You will find that although the rudiments are so easily learned, the art of modelling will not appear so very easy; and if you love your work, you will find there is more and more to learn, and the knowledge will gradually dawn upon you that sculpture is not merely a copy of what you see, but rather a free translation. It is easier certainly to produce a show in this art than in painting, that is, it requires a less skilled artist to reach to a certain point in the one

than in the other; but that being the case, it is equally certain that it requires greater art to put individuality into sculpture than into painting, and to touch the deeper chords of human nature, for that which helps you at the commencement of your career, namely, the simplicity of your materials, impedes you as you march onward, and makes it very difficult for you to impress your thoughts into it. You have form, and form alone, to deal with, color being entirely excluded. (The question of polychromy is not alluded to here, as the color employed by the Greeks was especially unrealistic and decorative in its character.) Sculpture, therefore, is one step further off life than her sister art, and it requires more imagination both to enjoy it thoroughly and to practice it to perfection.

To prove that form is more rarely appreciated than color, we would instance the general opinion of faces that we meet at an assembly. Ask why a certain face pleases more than another, and the answer will be generally one based on complexion and expression rather than on form. Now, complexion is impossible to render in sculpture, and in the power of expression the art is exceedingly limited; the subtle changings, the exquisite language of the eye, being entirely outside the province of sculpture.

We will assume now that you are not troubling yourself about the limits of a sculptor's art, that you are not going into the abstruse question of Lessing's "Laocoon," about what can and what can not be done, nor are dreaming at present of ranking with Phidias, Michelangelo, and the other giants, but are simply anxious to do your little in the modeller's art, and would be glad if all unnecessary difficulties were cleared for you.

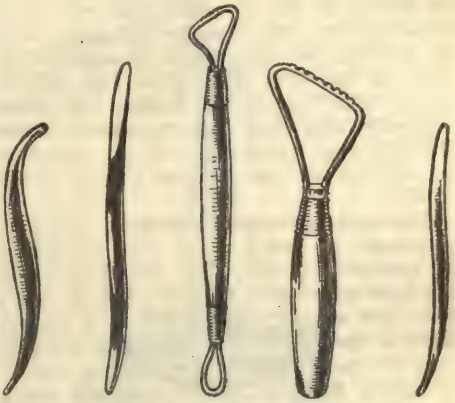
A few axioms may be useful at starting.

1. Do not be afraid of making a muss; the corollary naturally follows, do not work on a carpeted floor; select one where you can do as you like. See only that it has a good light, either a high side-light (blocking out the lower) or a skylight, the former being better because less flattering to your work; a room to the north or northeast is preferable in order to avoid the sun.

2. Work with soft clay, and have a sponge by your side to keep your fingers from sticking, and let the clay you put on be softer than that on which you work. The principle of modelling, as opposed to carving, is, that in the first you put on, and in the latter you take off. In using the wet sponge, first wash the clay from your fingers, then dry them on a cloth or towel.

3. Use your fingers as much as you can, and let your tools be as simple as possible —more like a continuation of fingers, as if Nature had provided you with two or three smaller and larger ones. Let them be slightly curved, just as your fingers when much used will of themselves assume a backward turn.

4. Be sure you consider the question of weight and balance when arranging your supports, or one fine morning you may see your work, when far advanced, lying on the floor. If you anticipate baking when the work is done, you must either have no supports at all, or place them in such a manner that you can easily remove them when the clay is tolerably hard, without injuring the surface of your work.



Wire and box-wood clay modelling tools for shaping where the fingers cannot be used conveniently.

5. All clays bake, some harder than others, but terra cotta merely means baked clay.

6. In working from life, depend as little as possible upon measurements; rely upon the eye, and so cultivate it.

"These few precepts in thy memory see thou character," to quote the worldy-wise Polonius.

In working from life you should also try to have your sitter very much in the same light as your work, for light and shade are most important factors, and you will find that the relative proportions of shadow were wonderfully understood in the best Greek work, and, in fact, in all good work, two equal shadows are never brought near to each other.

In addition to clay, you also use wax for

modelling; it has the advantage of being much cleaner, but still we should not recommend it, as clay admits of freer and quicker work, and the end is attained with more facility. English clay bakes about the same color as when moist. The French is dark gray, and bakes a light reddish hue. Besides the essentials—clay, tools, and a board—you will find it more convenient to have a proper stand, or banker, as it is called, with a revolving top, so that you may easily turn your model around, for it is most important not to work too long at one view—it is the fault of a sculptor when first learning to model.

Your sitters, too, you should make as comfortable as you can, so that you are not worried by their not being at their ease; an office revolving-chair on a raised dais is perhaps the best contrivance you can have while modelling in the round, to take relief into consideration, but this, though often tried at starting, we should not recommend at first. It has difficulties of its own, which, when understood, might hamper you when afterward modelling from the round. These difficulties of treatment will be overcome as soon as you have learned how to model at all.

One great advantage a sculptor has over a painter is that he can take advantage of artificial lighting. We can thus throw the light where we will; for, although work will, and should, look better in a certain light, it should not look wrong in any. It does not matter very much what you choose to model first; no doubt you will select something difficult, but will soon discard it for some more simple form. A foot, or a hand, whether antique or cast from life, is as good as anything, or a face where the planes are simple and broadly marked. For the foot or hand you would probably require no support at all; for the head, just an upright stick fastened well into a board, or bat, as we call it—that is, two boards, each about eighteen inches or two feet square, fixed at two sides with two-inch space between, one above the other, parallel, so that you have room to place your tools in between them. When you have the support ready, build your work up to the bat, keeping the upright well in the middle, so as not to let it protrude at the neck or elsewhere. Keep your work clean-looking and simple, the planes all distinctly marked, and particularly avoid all details and sharp cuttings until you have the general form rightly set in. It is good not to be always too near your work. Continually place your model and work together, so as to compare them, remembering to have them at the same angle to the light. You will understand by this that it is seldom you can sit to your work. When not working keep damp cloths over your work, and do not let the cloths touch the more important surfaces. A box made of laths covered with oilcloth is even better.

If you should intend that your clay model should go to the kiln to be baked, there are two or three particulars you must carefully attend to. In the first place, see that your clay is quite clean from lime, plaster, or stone, as the presence of any of these is sufficient to burst your work and make pieces fly. Secondly, before sending it away from your studio, see that your work is perfectly dry. It is only through non-attention in these matters that much of the beginner's work is spoiled in the firing; it is seldom the fault of the potter. A small figure can be baked solid, but a large one should always be hollowed out, as there is much more room for air to play round it. If you hollow it out, take care that there are a few small holes—in unimportant places where they would not be seen—to allow of escape of air. The hollowing out should be done when the clay is totally hard, but before it is quite dry. It is better to build up your work solidly and hollow it out afterward, than to hollow it out from the first. The latter can be done, but the difficulties necessitated by it are apt to distract your attention from your chief object, as very great care would be required to put the model together. The question of supports has been referred to. Most busts you can build up without any support at all; and for statuettes you can generally arrange a support that can readily be removed when the clay becomes of sufficient consistency to stand alone. Take care, also, that the clay is well kneaded, so that it holds together, and that there are no air-holes present.

You can never be quite sure of the color when baked, as that depends a little upon the surroundings of your work in the kiln, nor can you always avoid slight cracks.

There is another important point to remember about terra cotta. As clay naturally shrinks when drying, you must allow for it. If you should want your work, when finished, to be of a certain size, one-tenth is generally allowed—a little more or less would depend upon the degree of moisture that is in the clay, but it is seldom necessary to be so very particular.

There are drawbacks to terra cotta, but

it is well to know that terra cotta can be repaired. A thin coat of distemper or paint will hide the cracks, although it also slightly hides the more delicate modelling, so it is not therefore to be recommended for finer work—better show the cracks.

If you don't intend to have your work baked, but to have it cast in plaster preparatory for bronze or marble, you need not be so careful in preparing your clay, neither need you consider your supports except for their strength and position. Do not attempt to cast your work yourself, for it requires some little skill to mix the plaster, and there are men (molders) who make it their vocation—only caution them that you want your work returned to you exactly as you left it, otherwise you may find your surfaces all gone and worked out, or finished according to the molder's notion.

These remarks will assist those who might try to model unaided, but if you get to like the work, and would wish to succeed, you should take a few lessons from an expert, so as to be guided in your progress.

In modelling, remember always that you have merely form to deal with, but you have, if modelling a bust, to give the impression of the head and not a copy of it, and this is where the art of the sculptor is called into play.

In sculpture you can not give the color to the eye; you can not give eyelashes, nor the fineness of the hair—all these points so important in life—so you must execute your work that none of these specialties should be missed. "How is this to be done?" you will ask. In a great measure it must be left to you to decide, to your own feeling and individuality. There are several ways of interpreting life, and several schools formed on these ways of execution, and a sculptor is perhaps the last person to recommend one way or the other, as, if he loves his art, he has become a specialist himself, and would unintentionally direct you toward his own way of interpretation. He can teach you to see nature, it is true, but can only teach you to render it in his own way—he is not able to say which is the right way, probably there isn't one; it is only a matter of feeling.

The destination of a work as well as the subject itself, are most important factors in determining the treatment.

We will refer to one or two ways of treatment. For instance, in the eyes the Greeks left the pupils blank, but they gathered shadow by sinking the whole eye, and generally making the lower eyelid deeper than the upper. We moderns usually cut in the pupil, and leave the eye where nature placed it, conventionalizing the pupil more. Perhaps the former way is more suitable for ideal work, and the latter for portrait and character. The disadvantage of the latter way is that it is more dependent for its true effect upon the light in which it may be placed. The Roman work is marked much in the same way as our own, only not so deeply.

While speaking of the antique we caution you against a too free use of it. Students generally commence there, and they stop



Armature or support for a clay statue during work. It is composed of a square iron rod, with lead or copper tubes for arms and legs, carrying blocks of wood hung by wires to support the clay of the limbs

there so long, that the development of all individuality and life is checked.

It is certainly useful at first, because you are not troubled with a model's varying phases, but when you have attained some little proficiency in modelling, it would be better to go direct to life. In the antique, as in other work, there is both good and bad. Many of the figures, and also of the busts, are merely interesting from a historical point of view, and you must, as a student, look at them from the artistic side, to see whether the form is good, the lines well composed, and whether the entire builds up into one artistic whole.

BRASS WORK

THIS work is easy, pretty, and effective, and is well suited to ladies, as it does not require any great degree of strength.

Most of us know what is meant by *repoussé* work in metal. In that kind of work the pattern is beaten out at the back so that it stands out from the groundwork, which remains at its old level. The work which we are about to describe is precisely the opposite to this. Though the effect produced is somewhat the same, it is attained by different means. In a few words, instead of beating out the pattern from behind, the ground is beaten down from in front, leaving the pattern untouched.

PRACTICAL INSTRUCTIONS

TOOLS.—The tools required for this work are few and inexpensive. The beating down of the metal is effected by means of punches, struck by a mallet or hammer. It is well to use punches with some little pattern on them, for two reasons: first, because they are then less likely to slip from the exact place where the blow is required; and, secondly, because such punches give a grained surface to the groundwork, and such an appearance is more pleasing than a plain surface, and affords a greater contrast to the smoothness of the pattern. Punches suitable for this purpose are called "star" and "checkering" punches.

Besides these you will require some tool with a plain edge for marking out lines on the pattern itself. For this purpose a blunt brad-awl or small screw-driver may be used, or even a large nail filed to a similar edge; these tools should not be sharp, or you will run the risk of cutting the metal. These are also useful for getting into sharp angles in the pattern, where your punches, whether round or square, can not go; a triangular file broken off will also be found a handy tool for this purpose.

If you have any doubts of your ability to hit the head of the punch, it will be safer to use a mallet than a hammer, as a miss means an awkward rap on the knuckles. You will require a pair of shell shears for cutting the sheet metal; these are like a pair of very strong scissors.

QUALITY OF METAL.—The metal itself should be brass, at any rate to begin with, though if you like you may use silver when you get on.

The kind of brass to use is sheet brass; No. 7 gauge will be found to be of a proper thickness. It may be procured of any length; in width, from two or three inches upward. It is sold by weight.

THE PATTERN.—The first thing to do is to decide on the pattern, and we would suggest for your first attempt some simple design on a small piece of brass; a plain Latin cross on a bit four inches by three inches will do very well; or, if you like, the initial letter of your name. Cut your brass to the size required with the shears; you will find it rather difficult to make a straight cut of any length at first. This is because the part cut off does not yield and get out of the way like paper or cloth. You will have to bend it out of the way; it can easily be flattened afterward with the hammer.

Cut out a piece of *thin* paper (tissue paper does well) the exact size of the brass, and on it trace your pattern. Flatten the brass, and gum the paper to it. Never mind if there are a few small wrinkles; these will vanish when the paper dries. Thin paper

is recommended because thick paper is apt to loosen and come off when the punch is applied. This sometimes occurs even with thin paper, and if you find this happening, it is best to trace the pattern through the paper on the brass with some sharp instrument, taking care to scratch only very faintly. You can then wash off the paper, and be independent of it.

Preparing for Work.—To work on the brass, it must be fastened down in some manner, and the most convenient way of doing this is to put a strip of wood on each end and screw it down. The brass need only be covered by the wood for about a quarter of an inch or even less. The board to which it is screwed should lie quite flat and firm on the table, and the table itself should be a carpenter's bench, or some very strong and steady piece of furniture.

The most essential point about the punching is that it should be commenced at the edges of the brass, and worked inward toward the middle. If the piece of brass you are using is larger than is really required, it may be fastened down at once as recommended above. But if it is only the exact size, the edges, which are to go under the strips of wood, must be first punched.

Holding the punch perfectly perpendicular, strike firmly with the mallet, or hammer, so as to dent the brass.

Developing the Pattern.—Begin at one corner, and work all around the edge, allowing the marks to overlap each other somewhat irregularly, so as to do away with any suggestion of pattern in the groundwork. When you have got all round, do a second row inside the first in the same irregular manner. Enough of the ground will now be done to enable you to fasten it down with the strips of wood, and you can then proceed, working inward toward the pattern. As you get on you will see the inworked portion in the centre (containing all the pattern) rising up in relief. You must now be guided by the pattern itself. If it is a figure with no grounding in the middle, proceed with the punching right up to the edges of the pattern. If it has an isolated piece of groundwork in it, for instance, if it has the letter O, it will be well at this stage to begin punching the middle, and working alternately thence to the pattern, and from the outside also, for if you go quite up to the pattern from the outside before you touch the middle, the brass will have risen to such a height that it will be difficult to punch it down neatly.

On the same principle if the pattern has some groundwork running into it, as in the letter V, you should commence working up into this place before you have reached the pattern from the outside.

As a general rule, it is a good thing to keep the advancing line of dents at the same distance from the outline all round, that is to say, the punch-marks should give a rough representation of this outline. But no rule can be laid down on this point, and a few attempts will show you with tolerable certainty how to proceed in any particular case.

Holding the Punch.—As you get near to the pattern a new difficulty encounters you. This is caused by the fact that, as the centre has risen, you are working each punch-mark on a sloping surface of brass. Under these circumstances the punch will slip when struck, and will not make a clean dent.

This is very annoying, especially as it occurs chiefly when you are approaching the outline of the pattern and wish every blow to tell in exactly its right place.

It may be avoided by holding the punch very firmly against the brass and by giving the head of it a slight inclination outward from the pattern, so that the blow may be directed really at right angles to the surface, as was the case before the rising of the pattern took place. It is hardly necessary to mention that the punch is usually held in the left hand, and the mallet or hammer in the right, though it is sometimes convenient to work the reverse ways.

When you have worked up to the pattern in this manner, and have carefully gone round the outline, wash off the paper tracing, if you have retained it till now. You will then be able to see many little places which require punching, and this can be easily done by the aid of the eye alone.

If the punch-marks appear too marked or regular in any part of the ground, go over this again, until the whole groundwork presents a uniformly dented appearance.

Lines on the Pattern.—If any lines have to be marked out on the pattern itself, this is the time to do it. Intricate work on the pattern is difficult and not effective, but in many cases some simple lines must be made.

For instance, if a butterfly has been represented, it would be hopeless to attempt any reproduction of the pattern on its wings, but it would be easy (and sufficient) to mark out the division between its front and hind wings and the segments of its body. This should be done with the small screwdriver or brad-awl mentioned before. They

should be used as a punch, and the lines marked out by *light* blows of the hammer, as it is not desired to sink these lines down to the level of the groundwork. In fact, if they are well marked, the less indented they are the better. Be careful to hold these chisel-shaped implements upright when struck, as you do not want to dig the corners into the work.

It is difficult to give any idea on paper of the exact force which should be given to the blows of the mallet or hammer, but a few trials will put you in the way of it. The brass should be considerably indented, but, on the other hand, you must be careful to avoid making a hole.

Perhaps you will be able to get on better with thinner brass than we have recommended; this is a matter of individual preference.

FINISHING.—Your work is now finished as far as the punching goes, and you can remove the slips of wood which have been holding it down and examine it at your leisure.

You will probably find that it has a slight curl in it and will not lie flat. This may be removed by beating the groundwork lightly with a small hammer, and it will be found useful to beat it from behind, by turning it upside down and beating it on the projecting corner of a board. Of course, this corner must not project on the pattern, or the raised work will be beaten down.

If any fragments of paper remain, or any gum, they can be removed by warm water and rubbing with a rag.

POLISHING.—The whole work can now be polished, using sifted whiting, tripoli powder, or anything of that kind which will not scratch the brass. It will be a matter of taste or convenience whether you prefer the brass to look old or to keep it polished. In the former case, it only requires to be let alone, and in a very short time it will lose its bright polish and the pale yellow color which it will have immediately after it is cleaned. But if you wish it always to shine, you must either be always polishing it or else it must be "lacquered."

"LACQUERING" brass is nothing more than varnishing it with a transparent varnish, which protects it from the action of the air and enables the lustre to be seen through it. The varnish used for this purpose is "shellac" varnish, and is made by dissolving shellac in spirits of wine. As you will only require a small quantity, it will be better to buy it than to try to make it yourself.

Before applying it see that the brass is perfectly clean, then warm it, and lay on the varnish with a small brush. It will dry rapidly, and be hard and transparent if the work has been properly carried out. If the varnish becomes too thick, as it will do if the cork is ever left out, it may be thinned by adding some methylated spirits, and the brush can be cleaned in the same liquid, which may also be used for cleaning old lacquer off, or for removing an unsatisfactory coat before applying a fresh one.

MOUNTING.—The work is now ready for fixing wherever you intend, and this leads us to consider to what purposes such work is applicable. It may be generally stated that wherever a decorative panel of moderate size is required, this metal work will be found suitable. Perhaps the simplest thing to begin on, after your first attempt, will be a door-plate. We do not mean the brass plate on the outside of the front door, which conveys to passers-by the name and profession of the occupier, but the plates used on room doors to prevent the door from being soiled by the fingers. Such a plate should be attached to the door by very small brass-headed screws, and holes to receive them should be drilled in the corners. If it is not lacquered and requires to be cleaned, it is as well to cut out of a piece of pasteboard a hole the exact shape of the plate. This pasteboard should be held over the plate while it is being cleaned, and will protect the door from being injured by whatever composition is used.

USES OF BRASS WORK.—Brass work may be advantageously substituted for mirrors in the mahoganized furniture so fashionable at present, and it may also be used for the panels in the lid and sides of a wooden coal-box. A small shield, with a crest or coat of arms worked on it, is an effective ornament in wall decoration. Panels should have a slight margin left outside the worked part; this will be found useful in fixing.

You may also try to make a circular card-tray, or an oblong pen-tray. A margin must be left to form the sides of these articles, and the punching should begin from the inside of this margin.

This will cause the sides to rise somewhat, and will be sufficient, unless a very deep tray is desired. In this case more slope may be given by denting lines with your chisel-shaped tool on the margin at right angles to the edge. This will give a crimped look to the margin and make it

rise. The blows should be harder at the outside.

Time Required.—It may be well to say a few words about the time and labor required for this work. The time taken in drawing the pattern will of course be less if the worker is gifted with sufficient artistic power to enable him to rapidly sketch the outline from the subject, whatever it may be, but a very short time will suffice even for those who have to trace their outlines. Leaves, etc., may be put on the paper, and the outline traced directly from them.

Anybody can draw geometrical patterns with rule and compasses, though we think they are usually unsuited to brass work.

The actual labor of working the punch is very slight, though it may be found that the hand which holds it is apt to get rather cramped at first. The time required will, of course, depend greatly on the intricacy of the pattern, more care being required where there is much outline, but at the same time there will be less ground to do if the pattern covers much space. About twenty minutes should be ample for a square panel of five inches in the side, that is to say, with an average pattern, but this is not meant to include tracing or fixing the paper design.

Suitable Designs.—With regard to the sort of designs which can appropriately be represented, it is really so much a matter of taste that no absolute rule can be laid down. Speaking generally, any subject which can be expressed chiefly by means of outline is suitable. Leaves, either singly or in the form of sprays, will do very well. One should go to the right source for the model—nature herself. Of course, any kind of motto or saying may be worked on a band of brass, if you have a suitable place to put it in when finished.

Insects produce an effective and quaint appearance. Butterflies and moths, with their wings extended, or flies, with the wings closed about the back, are easy and striking, while beetles have quite a "cunning" look. Some large beetle should be chosen, either the Egyptian *scarabæus* or the large water-beetles of the ponds.

You can attempt to imitate, if you will, the old *repoussé* work, of which Cellini was such a master, though you will perhaps be unable to try it on the same precious metals which were placed at his command by his wealthy and influential patrons. Learn, however, to command your temper better than he did; you may be sure that your work will be none the worse for that.

In these days, a greater respect for life prevails than in his age, and when we want to defeat a rival, we do so by trying to make our work better than his, and not by an appeal to arms.

A little care and pains will enable you to turn out very fair work, and you will be surprised and pleased to find what a wonderful effect may be produced by such simple means. You will have to exercise your forethought in the selection of a subject within the range of the process and the reach of your own powers, and your manual dexterity will be called out in the execution of the work. It is an old saying, but a very true one, that what is worth doing at all is worth doing well.

Work done badly bears on it the stamp of its own worthlessness, the confession that the workman had not thought it worth doing. A beginner's work can not be as good as that of an old hand, but let it be the beginner's best, and nobody should complain. And whatever you do, fit yourself up a workshop of your own, where you can carry out your brass work or wood carving and other such employment conveniently, without fear of interruption, or of being told you make a "horrible mess."

WOOD CARVING

THE art of wood carving is a very ancient one and has always been the close rival to sculpture or carving in stone; although, of course, its greatest field has ever been in the line of producing household furniture and interior decorations. Like several other arts, its essential principles are extremely simple, and, as a matter of fact, after the uses of the various tools have been thoroughly understood, any one with artistic taste and sufficient perseverance to persist in the study of the art should soon become a good wood carver.

PRACTICAL PRINCIPLES

VARIETIES OF WOOD CARVING

THERE are several varieties of wood carving which may be classified according to the style of work or the style of designs. Under the first head, there are three varieties—flat or stamped work, intaglio or sunken work, and round carving or lowered work. So far as the style of designs is concerned, there are a number of varieties belonging mostly under the head of intaglio and incised work—such are the majority of designs in scroll work and geometrical figures, rosette work, or diapering, and the effective chip carving.

TOOLS.—The tools used in wood carving are of a few varieties of chisels and gouges. The chisels have flat blades, such as are used in carpenter work, while the gouges and modellers have the cutting edge more or less curved according to requirements. The manner of using these tools is much the same as in carpentering; the general plan being to drive the cutting edge into the wood with a rawhide mallet, or with a wooden club cut down to form a handle at one end.

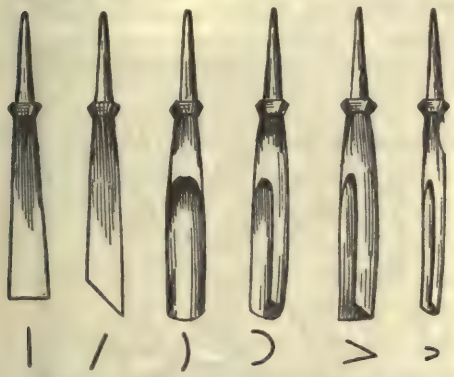
FLAT CARVING.—The ordinary flat carving, which is the variety most often undertaken by the beginners, is produced by merely tracing a design on the surface of a panel and then cutting around it carefully with a chisel-shaped gouge having a deeply grooved cutting end, almost U-shaped; this is called a "veiner." When a design is thoroughly cut out, the background effect is produced by use of a stamp or punch. When this kind of work is well done, it is highly effective, but, as a general rule, its use is confined to household furniture, panels, etc.

INTAGLIO CARVING.—The variety of carving work known as intaglio is produced in much the same manner, except that, instead of being left flat, the body of the design—leaves, flowers, etc.—is cut out, leaving the background in relief. The work of cutting out the design is done chiefly with small gouges, after which the background is usually hammered in, as with the former variety of carving.

SUNKEN WORK.—Closely allied to the intaglio and flat carving, at least in the manner of its production, is the variety of work found with flat designs and sunken background. The background is cut out, leaving the design in flat relief. It is used largely in panel and scroll work, on household furniture, etc.

LOWERED WORK.—The round carving, or lowered work, is the most difficult, as well as the most artistic, variety of wood carving. Its successful production depends, of course, upon the extensive use of carving tools and wide experience in handling designs. Briefly described, the process of producing this kind of carving is as follows: The design is first transferred to the surface of the wood, being traced on with a pencil, so that its outlines are clear and

sharp. The next step is to cut out the design, which is done with a flat chisel, usually with one about one-half inch across. This is grasped firmly in the left hand, so that the blade touches the wood at a slight angle from the perpendicular. With the use of a mallet the point of the chisel is driven into the wood to a certain definite



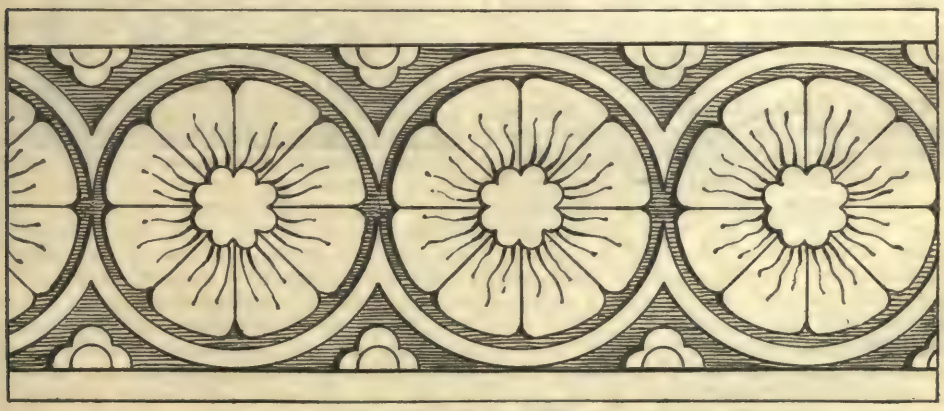
Wood Carving Tools, Chisels, Gouges and Modellers, also Shapes of Cutting Edges

depth, which is generally not more than a half-inch at each incision. This process is called "stabbing." After the design has been thoroughly cut out, especial care being taken to make the incisions to the same depth in every case, the background may be carefully cut away on all sides, leaving the design in high relief. The best procedure in this work is to shave the wood out gradually, and not to attempt cutting out large chips at a time. It is also better to cut across the grain in many varieties of wood, thus avoiding the danger of splitting or tearing.

When the background is thoroughly and cleanly cut away from the design, the work of modelling or shaping the essential details of figures may be undertaken. This work had better be guided by the use of clay or wax models, wherever possible, or with the use of the natural objects themselves. When flowers or leaves are to be cut out, the upper surface of the design is, of course, modelled first, the shape and the contour being carefully formed with suitable gouges and modellers. After the upper surface is complete, the wood may be cut away beneath to a level with the background, to give the necessary relief effect. This work is, of course, extremely delicate, and requires the utmost skill and experience, particularly in the production of designs of flowers, leaves, birds, etc., in which some portions of the figures are almost entirely cut under.

Modelling.—The work of modelling the surface of carved figures is a detail requiring much skill and taste. According to many authorities it is desirable that the carver have clay models to work from, as by this means he is able to obtain a far more complete idea of the designs to be produced than would be possible from the best drawing or print, and, in many cases, from nature itself. The use of clay is recommended for the production of trial models, since it is far more readily worked than wood, and the carver can speedily judge of the effect of his design. This is, however, a mere detail, to be determined largely by the experience of the carver, or by the degree of skill he may possess.

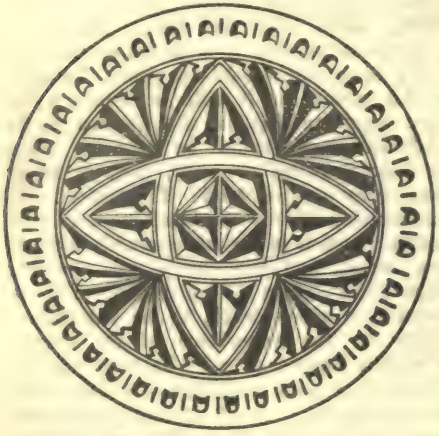
Clamping and Working.—In the work of carving, the wood should always be firmly clamped to the table, in order to prevent all slipping. When the carver is working upon an article composed of separate parts—such as boxes, and easels, and



Design for Rosette Work 18

several other articles of furniture—it is necessary that each portion be carved and worked separately. This is necessary, both because the carver can obtain the requisite grip upon his material only by taking each piece separately, and, also, because, if the work was attempted on the completed article, straining and breakage would probably result.

Polishing.—After the work of carving designs is completed, and the parts of the box, or other article of furniture, have been put together, the work may be polished. This process is accomplished by thoroughly smoothing all surfaces with fine sandpaper, and then smoothing down the plain portions with pumice-stone and oil. When the perfect smoothness has been attained in this manner, a thorough coat



Design for Chip Carving

of boiled linseed oil may be applied with a brush. After thoroughly drying in some place out of the reach of dust, another coat of boiled oil may be applied; and this process may be repeated as many as three or four times, if desired.

Care of Tools.—An all-essential point in successful wood carving is to maintain the tools in good condition and perfectly sharp. Of course, it is necessary that they be of the best quality, and made of the finest steel, since in this art, more than in carpentry, a poor chisel or gouge is a serious consideration. Carving tools are sharpened not alone on one side, as with a carpenter's chisels and gouges, but, after the edge has been thoroughly formed with a stone or wheel, the inside edge must also be ground on a small piece of oil stone called the "slip." These slips are mounted in wooden holders so that they may be inserted in a vise and held fast while the edge of the tool is being ground. It is a comparatively simple matter to grind carving tools properly when the matter is once thoroughly understood. It is always more convenient to follow the plan of doing one's own sharpening than to depend upon the convenience of carpenters or machinists.



Design for Panel in Raised Carving

Varieties of Wood.—A skilful wood carver can, of course, work with almost any kind of wood, provided it be sufficiently close-grained to prevent tearing or splitting with the application of tools. The best woods for this purpose, however, are black walnut, oak, mahogany, and cherry; all of which are close-grained and not liable to mar the design by warping or splitting in sufficiently heavy work.

PYROGRAPHY

THE form of artistic work known as pyrography is, briefly, drawing outlines and shaded pictures on wood or leather with a red-hot needle, or, as in former times, with heated pokers of various sizes. By a little practice, any one proficient in pencil drawing can very soon learn to produce clean and handsome sketches by this process. Since, to all intents and purposes, it is merely drawing with a hot point, instead of with a black lead, it will be necessary to do no more than to touch briefly on several matters connected with the necessary apparatus and its operation.

PRACTICAL INSTRUCTIONS

THE NEEDLE.—The first step in rendering pyrography a practicable art, at the present day, has been in substituting a hollow point of platinum for the heated pokers of former times. The platinum point is screwed into a metal tube surrounded by a cork handle, and connected, through a long pipe, with the stopper of a small bottle filled with gasoline. Opening into the gasoline bottle is another rubber tube, at the extremity of which is a double elastic bulb, for the purpose of forcing air through the gasoline, and thence through the first rubber tube to the platinum needle.

PREPARING FOR WORK.—To heat the tube sufficiently to begin work, it is necessary only to begin forcing air through the gasoline, with the result that the carburetted mixture is forced into the needle. This mixture, being highly inflammable, will ignite and maintain the tube at a high temperature by thrusting it into the flame of an alcohol lamp. When the desired degree of redness appears upon the point, it may be withdrawn from the alcohol flame, and is then ready for beginning work. The advantage of using platinum for the needle is that this metal more readily absorbs and retains the inflammable gas than any other.

OPERATING.—In working with the pyrographic needle, it is necessary only to constantly force air from the bottle of gasoline, in order to maintain the required temperature. A little practice will very soon enable one to make clean-cut and even lines, provided only that the needle be kept constantly heated.

GENERAL DIRECTIONS.—There are really very few points that a person at all acquainted with pencil drawing will need to learn in mastering the art of pyrography, although there are several matters which must be carefully understood, on account of the difficulty of handling a peculiarly shaped drawing instrument, and of using fire as a means of marking.

In the first place, the student must learn, by careful practice and observation, exactly what degree of heat is indicated by the color of the needle, and exactly how much pressure of the hand is required to make lines of the desired depth and heaviness on given kinds of wood. It is essential that he be careful about this matter, since very many handsome designs



AN EFFECTIVE AND EASILY PRODUCED DESIGN FOR PYROGRAPHIC DRAWING

are marred by an incorrect use of lines and shading. The temperature of the needle may be regulated by varying the amount of air forced through the gasoline, and the proper temperature for a given kind of wood, together with the pressure required in any case, may soon be found by careful experiment.

In making curved lines one must always be careful to remember that he is using an instrument shaped somewhat like a pen, and that, in order to produce the effect desired, he must change the position of his hand gradually. If this rule is not carefully observed, the needle will burn a jagged and ugly line, where a clean and even one was desired.

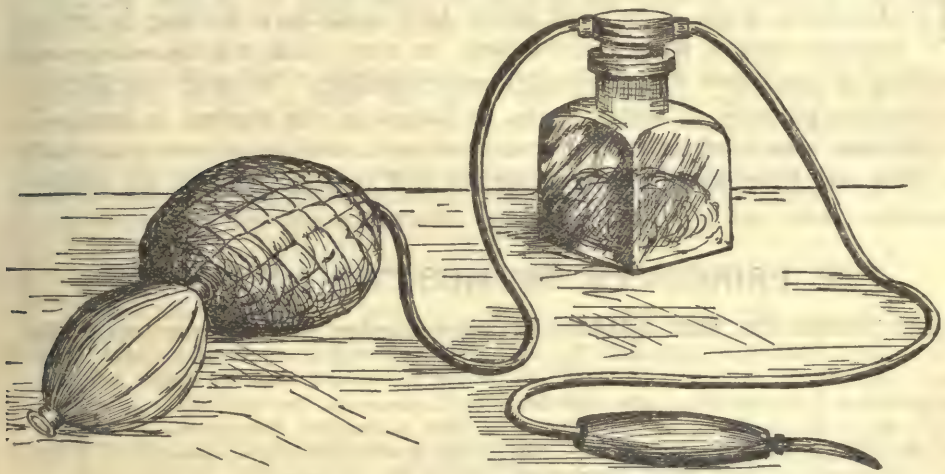
Another point of considerable importance is to avoid making deep points at the beginning and at the end of a straight line; this result is due to the fact that the hand, unless trained by careful practice, is liable to pause at the commencement and end of a stroke. A perfectly artistic line can best be made by bringing the needle lightly down upon the wooden surface, causing the line to be only a part of the sweep described by the wrist. It is necessary, however, that the strokes be made lightly, since the needle is fragile, and, when once broken, can not be readily repaired.

In the production of really artistic effects, such as landscapes, human faces, figures, animals, etc., considerable practice is necessary to enable the production of the required quality of lines at the various points. A heavy line in a portion of a picture that should be lightly shaded will mar the general effect very much more than a light line at a point to be heavily shaded. The ability to produce the proper strength and quality of lines can be acquired only by careful practice with various kinds of wood and with various temperatures of the needle. Beyond this the matter belongs more properly to drawing in general, and the effect is to be determined solely by the skill of the artist.

As regards the kind of wood to be used in this work, it may be said that the best quality is of close grain and medium soft. To use wood that is too soft involves the danger of making lines deep and heavy. With a very hard wood the irregularity of

the lines is nearly the greatest source of trouble. However, with sufficient practice, very nearly any kind of wood from white pine to box-wood may be successfully used. The most usual quality of wood for this purpose is bass-wood, white-wood, and pine; good effects have been produced with box-wood and others of close grain. If the artist will thoroughly understand the fact that good pyrographic work demands the use of clean and even lines of pencil drawing, or any other branch of art, he will experiment carefully to acquire the ability of producing them.

In burning pictures and figures on leather new difficulties arise; not only does this substance so vary at different points as to make the production of even lines very difficult, even with the greatest skill, but the ill-smelling smoke that results from burning it is both trying to the eyes and nauseating. The smoke produced by burning several qualities of wood is almost as disagreeable, but the would-be pyrographist must accustom himself to such annoyances, or, by careful handling of his instrument and the habit of working rapidly, reduce them as far as possible.



THE APPARATUS USED IN PYROGRAPHIC WORK

RUDIMENTS OF MUSIC

IN studying music it is quite as essential to learn the meaning and value of musical notes, signs, and terms, as it is to learn reading, in order to understand a language. Indeed, in every case, the knowledge of reading is necessary to a thorough understanding. Without the ability of reading properly, in either music or language, the student is deprived of the best source of instruction and the best corrective of errors, as well as shut out from most of the thoughts and achievements of his predecessors.

THE PRINCIPLES OF MUSICAL NOTATION

THE TONES OF THE SCALE.—All musical ideas are expressed by the seven tones of the natural *scale*, which are designated by the letters of the alphabet, *C, D, E, F, G, A, B*, or, by the syllables *Do, Re, Mi, Fa, Sol, La, Si* (or *Ti*). On the pianoforte, or any other instrument, these tones follow each other in regular succession from *A* to *G;* each *G* being succeeded by the *A* of another series higher, or more treble, in sound. When several successive notes are sounded in succession, we have a *scale*. The word, "scale," is derived, through the Italian, from the Latin *scalaria*, a "ladder," which, in turn, comes from the verb, *scandere*, "to climb"; thus indicating a regular progress by consecutive steps, either upward to the high, or treble, notes, or downward to the low, or bass, notes. The terms, "low" and "high," as applied to musical tones, are derived from the use of the human voice, in which the bass notes are apparently formed in the chest, according to the theories of some, while the treble notes vibrate in the highest cavity of the head.

A complete scale beginning at *C*, for example, and running through all the intervening tones, either above or below, up or down, is called a *gamut;* and all the notes, taken together from any one note to its similarly lettered counterpart, eight notes above or below it, form an *octave*, which is the Latin word for "eighth."

THE ACCIDENTAL SEMITONES.—In addition to the seven tones already mentioned, which are known to musicians as *full tones* or *naturals*, each *octave* contains five others, known as *semitones* (half tones) or *accidentals*. These are the sounds represented by the black keys on the piano or organ, and are designated in musical writing as the "sharps" (♯) or "flats" (♭) of the notes, either immediately below or immediately above each of them. Thus the black note on the piano, immediately following *C* and preceding *D*, may be indicated in written music either as *C*♯ or *D*♭.

The *semitones*, occurring as they do in the musical *octave*, naturally vary the *intervals*, distances, or sound-values between several notes in each series. Thus, while the intervals between *F* and *G*, *G* and *A*, *A* and *B*, *C* and *D*, *D* and *E*, are all whole tones, since a *semitone* occurs between each two of them, the interval between *B* and *C*, and between *E* and *F*, is only a *semitone* because no other sound intervenes, each following the other directly on the piano keyboard. The distance between any two

tones in the scale is called an interval, and, because there are eight *natural tones* in a complete *octave,* it follows that there are seven *intervals,* or thirteen "half steps." There are, also, two kinds of *scale,* the *diatonic* and the *chromatic.* The former contains only eight tones, sounded as explained later; the second advances by a succession of *semitones* precisely as they occur.

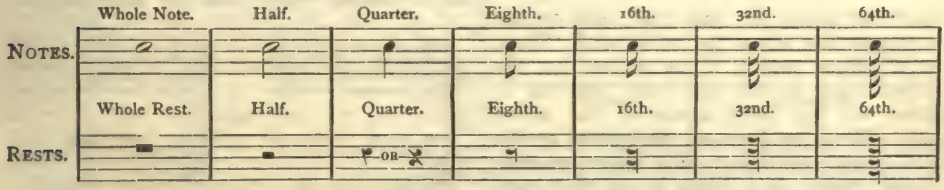
THE TIME ELEMENT.—In producing music, it is necessary to have, not only different tones, but also variations of time; for, as may be readily understood, if every tone were sounded for exactly the same length of time, the effect of the music would be very unsatisfactory, and its power of expression extremely limited.

CLASSES OF NOTES.—There are, therefore, seven different classes of notes used in writing music, and any of them may be used for any tone in the *scale.* They begin with the whole note, or *semibreve,* which is sounded in the violin, mandolin, and guitar, and on the wind instruments, for the full time represented—this is generally the period occupied while one counts "four," at the ordinary conversational rate of utterance—and, on the piano and organ, he key is held down during the same period. The remaining six notes are fractional parts of the *semibreve,* and are designated as the half note, or *minim,* two of which are equal to one whole note, in point of time occupied in sounding; the quarter note or *crotchet;* the eighth note or *quaver;* the sixteenth note or *semiquaver;* the thirty-second note or *demisemiquaver;* and the sixty-fourth note or *hemidemisemiquaver.* The *semibreve* is indicated by an oval figure, somewhat like the letter O tipped to one side; the *minim* is the same figure with a stem at one end extending either up or down; the *crotchet* is a black note with a similar stem; the *quaver* is a black note with a stem carrying a hook at its further end; the *semiquaver* is the same with two hooks; the *demisemiquaver* is the same with three hooks; and the sixty-fourth, the same with four hooks.

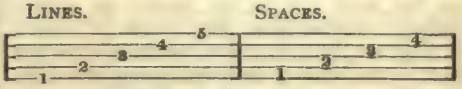
When several *quavers,* or other hooked notes of the same class, follow in succession, the hooks are extended into bars, which connect all the notes in each series. Thus, a series of *quavers* has one bar; a series of sixteenth notes, two bars; a series of thirty-second notes, three bars, etc. Frequently, we find eighth and sixteenth notes, or sixteenth notes and thirty-second notes, in a series, extra bars being added to reduce the time of the smaller notes in any case desired.

THE STAFF.—In order to combine the notes of any required time-value with the proper tones, in writing a musical composition, the notes are written upon what is known as the *staff* or *stave.* This consists of five horizontal parallel *lines* with four equal *spaces* between them. The *lines* are designated as *first, second, third,* etc., from the bottom; the *spaces,* as *first, second, third,* etc., also from the bottom. A note may be either on a *line,* when the *line* passes through it, or on a *space,* when it is between two *lines.*

THE NOTES AND CORRESPONDING RESTS



As written, the *staff* gives opportunity for indicating eleven full tones, counting one note written below the first line, and another written above the fifth line. Since, however, this number of notes represents

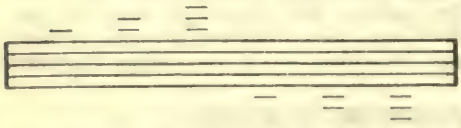


a very small fraction of the tones actually available in any instrument, it is necessary to resort to several additional devices, in order to enable the musician to find the tone indicated by any given note with least possible trouble.

The first, and most important, device of this description is to divide musical notation into two *clefs,* called, respectively, the *bass* and the *treble clefs.* As written for all modern instruments, the *treble clef* has

the tone, represented by the *G* above *middle C* on the piano keyboard, on the second line, and the *bass clef* the tone corresponding to the pitch of *F* below *middle C* on its fourth line.

Leger Lines.—The second device for simplifying musical notation consists in the use of *leger lines*, which are, briefly, merely extra lines either above or below the *staff*, for writing notes outside of the limited range of the *staff* tones in either *clef*. Thus, there may be any number of lines or spaces, above or below the staff, but each note, whether on a *line* or on a *space*, must have sufficient number of *lines* between it and the *staff*, to indicate the precise relative position of its tone. In order to understand the system, involved in separating the *clefs* and using *leger lines*, we may point out that the tone, represented by *middle C* on the piano, is written on the *first*

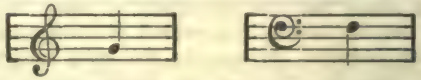


leger line above the *bass staff*, and on the *first leger line* below the *treble staff*. Thus, the *C* below *middle C* is written on the *second space* of the *bass staff*, and the *C* above, on the *third space* of the *treble staff*. The *leger lines* are designated as the *first, second, third,* etc., *lines* above, or *first, second, third,* etc., lines below the *staff*. The first note above the *staff* is said to be on the *first space above*, and the first note below the *staff*, on the *first space below*.

The Ottava.—The third device for simplifying musical notation is to use the *ottava*, which, written above the staff, thus, *8va.* with a series of dots, or a waved line, following, indicates that the notes written on the *staff* are to be played an *octave* higher. Accordingly, the *octave* is raised, so long as the dotted line extends over the staff. The dotted line following the sign for the *ottava* sometimes ends with the word *loco*, which indicates that the music is to be played thereafter as written. If the sign, *8va.*, is followed by the word, *bassa*, the notes are to be played an *octave* lower than written. Sometimes, particularly where the last sign has been used, the word, *alta*, is used to indicate that the notes are to be played an *octave* higher. When the tones, to be indicated by notes, are either so far below the *treble staff*, or so far above the bass as to render difficult the use of *leger lines, ottavas*, etc., the opposite *clef* sign is written on the *staff*, and the tones indicated accordingly. On returning again to the *staff* compass, the proper *clef* sign is written again, and the notation changes accordingly.
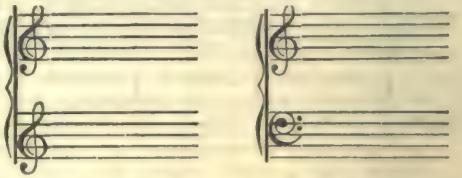
The Clefs.—As it is necessary to indicate the *clef* in which a given bar of music is written, the *treble* is indicated by a sign resembling the figure &, which is said to

Treble or G clef. Bass or F clef.



represent the old Gothic *G*, and the *bass clef*, by a mark resembling the letter *C*, which is said to represent the Gothic sign for *F*.

The Brace.—When two *staves* of music are intended to be played simultaneously, they are connected by a *brace*. Thus, two *treble staves* may be connected, when the music indicates a duet for two violins, a flute and violin, or any two other instruments having their music in this *clef*, or for a human voice with an instrumental



accompaniment. Music for the piano or organ is written with a *treble* and a *bass staff* joined by a brace, and when music for the human voice, or some treble instrument, is to be played at the same time, an extra *staff* is written above the *F clef*, and connected to the end of the *staff* above the *brace*.

The Rests.—We have learned thus far that true music requires, not only variation in tones, which is supplied by the musical scale, but, also, variation in time, which is supplied by the notes of different lengths, and combinations of the same. In order, however, to fulfil all the requirements of modern music, it is necessary that the effect of tone and time be heightened by measured intervals of silence. This requirement is supplied by the marks of notation known as *rests*. Moreover, these rests must be of varying length, exactly like the notes. The accompanying diagram illustrates the seven kinds of rests, with the

notes to which they correspond in length. The *whole rest*, as shown, is always written below the *fourth line* of the *staff*; the *half rest*, above the *third line*; the *quarter rest* has two forms, the most common being a short line with a hook turned to the right; the *eighth rest* resembles the first form of the *quarter rest*, except for the fact that the hook is turned toward the left; the *sixteenth rest* has two hooks like the sixteenth note; the *thirty-second rest*, three

RESTS IN ONE OR MORE MEASURES
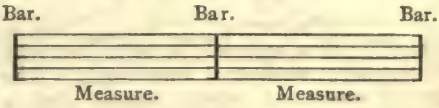


hooks like the thirty-second note, and the *sixty-fourth rest*, four hooks like the sixty-fourth note.

Rests are never connected by a tie, but follow one another in succession, until the required period of silence is completely indicated. When more than one *bar rest* is required, it is indicated, as shown on the accompanying *staff*, the notation varying according to the number of *bars* to be *rested*. More frequently, however, the *rest* for one *bar* is indicated by the somewhat elongated *whole rest* with some figure above it; for indictaing the *rest* for more than one *bar* slanting parallel lines are used.

Dotted Notes.—Similar in character to the *rests* are the *dots*, which frequently follow the notes. Instead of indicating an interval of silence, these *dots* require that the notes preceding them be increased in time. Thus, one *dot* following a note in-

whole note, plus one *minim*, plus one *crotchet*. A *minim* followed by two *dots* has the value of a half note, plus one *crotchet*, plus one *quaver*. *Rests*, also, may be extended in time by *dots* written after them, in precisely the same manner as the notes.

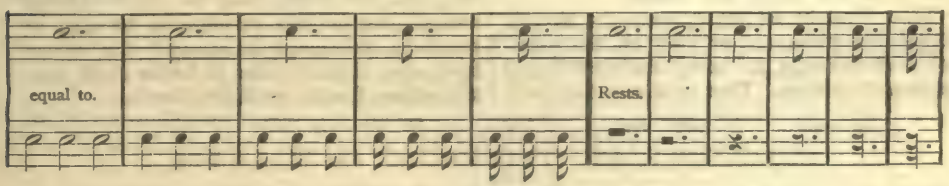
Of the Measure.—The last, but perhaps the most important, element in musical notation is that of *measure*, which, properly speaking, supplies the metrical rhythm to a musical composition. We may have a series of notes of known time-values, written upon a *staff*, so as to indicate certain tones. But, unless the composition be properly punctuated, or divided into distinct sections, like the words or phrases of written language, it is entirely unintelligible. Accordingly, each *staff* in a musical com-



position is divided into a series of sections, commonly known as *bars* or *measures*; each of which is equal in time-value with every other in the same piece.

Such a division is indicated by a line drawn perpendicular to the lines of the *staff*, and, with braced staves, directly through both *clefs*. The conclusion of a

DOTTED NOTES AND RESTS



volves that the time of the note is increased one-half. A whole note followed by one *dot* is to be sounded to the value of three *minims*, etc. Where two *dots* follow a note the time of that note is to be increased three-quarters. Thus, a whole note followed by two *dots* has the value of a
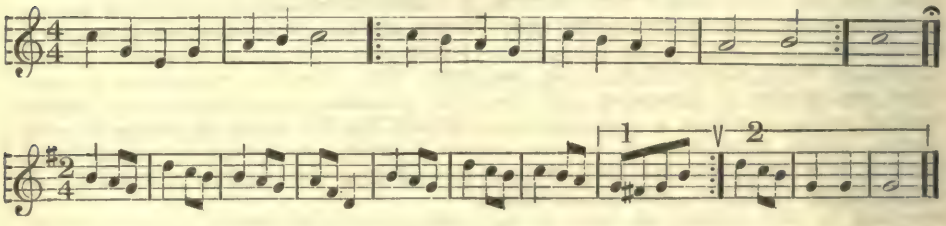
composition of music, or of a principal part, is indicated by two thick lines drawn across the *staff*. When these lines have two dots to the left that part of the music which precedes them is to be repeated. When the dots are both to the right and left of the bars, the measures both preced-

ing and following them must be repeated. This is called a *double repeat.*

Repeat Signs.—While treating of the musical measures in general we may turn our attention to the subject of repeat signs. The methods of indicating that a measure or a succession of measures must be repeated are various. In addition to the repeating dots before heavy bars, as already mentioned, we frequently find the letters, D. C. (de capo), written over a double bar. This signifies that the opening strains of the piece must be again played before concluding. In other pieces the final bars have horizontal lines ruled above them with the figures 1 and 2, indicating that the piece is to be played down to the measure written between the bars of each measure must have the same value, as counted by the student in practicing, or must occupy precisely the same amount of time in playing as the notes contained in every other measure in that particular piece. On the other hand, different compositions vary in time, and, consequently, also, in value of each separate measure.

The accompanying figure illustrates the value of almost all the common measures. These are indicated by numbers written after the *signature* at the beginning of the first *staff.* Thus, the common or 4-4 measure indicates that the value of a whole note is to be counted in each bar. This may be one whole note, two *minims,* or four

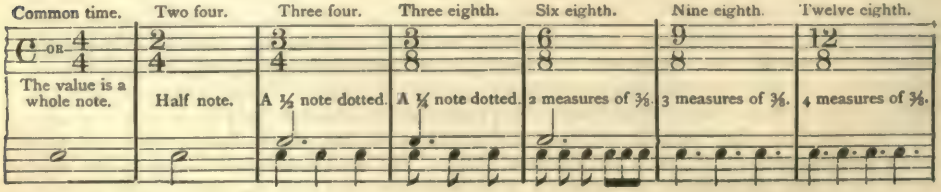
EXAMPLES OF REPETITION



marked 1; then repeated, so as to end with the measure marked 2, omitting 1. The sign of repeat, or return, shaped liked a crossed S with dots on either side indicates that, beginning with the measure over which it is written, the music must be repeated a second time to the point where it is found again, or where the word, *"fine,"* occurs, or any sign designating the conclusion of the piece. The word, *bis,* placed over one or more bars of music, or placed at the beginning of a series of bars, and followed by a wavy line, indicates that these measures are to be played twice; the word, *bis,* being the Latin for "twice."

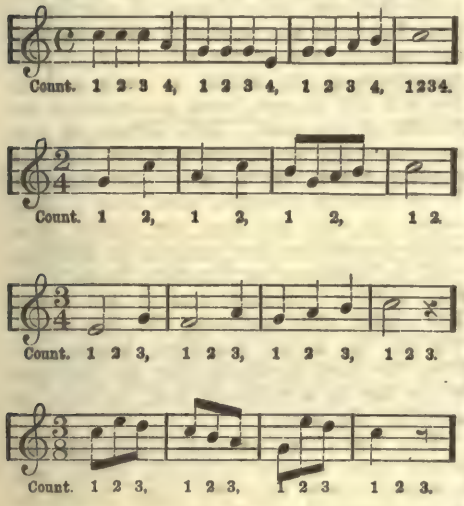
Time Values of Measures.—As already stated, the measures or bars on the musical staff indicate so many divisions equal in respect to time. That is to say, the notes *crotchets,* the last being the most usual. In order, therefore, to learn the correct time for playing a piece written in this measure the student should count "four" between each pair of bars; making the counting as even as possible, or using a metronome to secure positive accuracy. In the same fashion, the 2-4 measure indicates the value of one *minim* or two *crotchets,* each measure being counted thus, 1, 2; the 3-4 measure is equivalent to a dotted *minim* or three *crotchets,* and may be measured by counting thus, 1, 2, 3. The values of the other measures are given in the diagram. In every case the upper figures indicate the number of notes to be used in regularly measured bars, and the lower figure the kind of notes to be so used, usually either fourth or eighth notes.

INDICATIONS AND TIME-VALUES OF MEASURES



COUNTING TIME.—In attempting to play a given piece of music the first thing that is essential to the beginner is that he carefully consider at all times the precise value of the notes used. This is the reason that in practicing a piece he counts each measure as above indicated. He must always
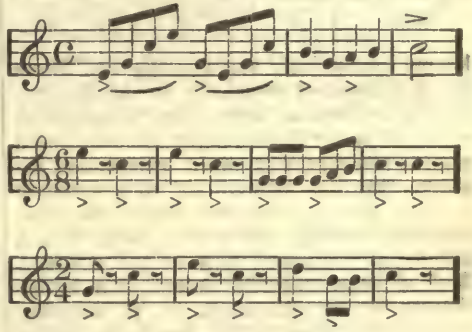
TIME OF VARIOUS MEASURES
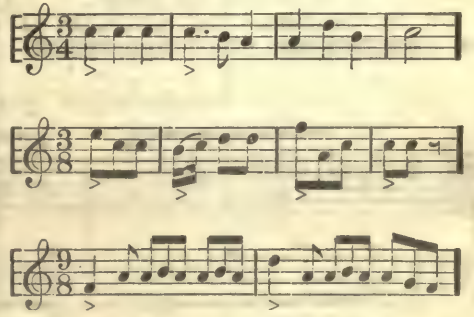


remember that a *minim* is equal to two *crotchets*, and must count 1, 2, for it, where the *crotchets* count 1. It will always be the best plan for the beginner in music to count the measures aloud, as he is practicing them. While, of course, it is of prime importance that he learn to read the music correctly, striking the tones precisely as they are indicated on the *staff*, it is undesirable to begin either too fast or too slow, since, in either case, he will lose the sense of proper proportion. If he begin too slow, he will confirm himself in the habit known as "dragging" or "hanging back": if he begins too fast, he will run the risk of stumbling and slurring, where he should give distinct and studied expression. A good rule given by music teachers is as follows: "Never begin a piece at a rate more rapid than you can readily continue to the end."

MUSICAL ACCENT.—After the student has thoroughly mastered the measures of music, so as to be able to play any indicated time correctly and evenly, he is ready to take up the last element of music—accent. This matter holds precisely the same relation to properly played music that accent and stress hold in properly spoken language. Just as we notice that a person, speaking with a certain rapidity, will give approximately the same time value to the vowels and syllables of equal length, which, if arranged in the regular order, called "rhythm," would give true poetry, so, in music, the division into *bars* or *measures* indicates the time-values, while the proper accent supplies the other element of musical rhythm. Although accent is not regularly indicated in musical compositions, the proper sign is an arrowhead pointing toward the right. This is not used in ordinary notation, since the rules of accent are definitely established for the various kinds of measure. Thus, the rule is that, for common time 2-4, 6-8, and all other even numbers, each measure is accented both at the beginning and at the middle. A 3-4, 3-8, or other odd-numbered measure, is

ACCENTS OF EVEN MEASURES



ACCENTS OF ODD MEASURES
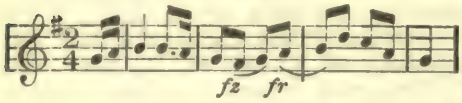


accented upon the first note only of the measure. These rules are indicated in the accompanying figures. In order to facilitate the correct phrasing of a piece in a measure indicated by odd numbers, such as 3-4, 3-8, also 6-8, the notes taking bars
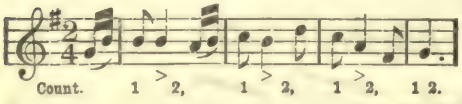
across the stems are combined in groups of three each. However, in time indicated by even numbers, notes requiring bars are combined in groups of even numbers.

Irregular Accent.—While, as we have already learned, accent is not indicated when it follows regular rules, it is necessary, for the proper effect of the piece, to introduce irregular accents at points in the measure other than those on which the stress properly falls. The most important irregular accents in common use are those

EMPHASIS



SYNCOPATION
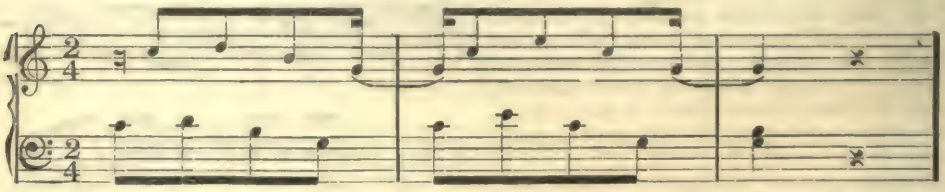


known as *emphasis* and *syncopation.* These are distinguished principally in the fact that emphasis indicates merely that a particular stress is to be thrown upon an unaccented part of the *measure;* while, syncopation involves that the weaker part of a measure is to be given greater importance than that regularly taking the accent, and, hence, called the "stronger" part of the *measure.* Both of these irregular accents may be indicated by the characters, *fz, rf,* meaning respectively, the Italian words, *forzando,* "forcibly," and *rinforzando* "very forcibly," or "with additional force." They are also indicated by arrowheads and carets.

On Syncopations.—The *syncopation* is an *accent* often very difficult to render correctly, as it is extremely probable that the wrong time will be given to the measure in which it occurs. In the above example of 2-4 time, the accented note in the three measures is a *crotchet.* This makes the proper rendering of the *accent* somewhat easier than is possible in very many pieces. In order to learn it correctly, the student had best count each measure thus, "one and, two and," playing the second note on saying "and"; holding it down until he has said "two," and releasing it only when he emphasizes the second "and," and plays the remaining notes of the *measure.*

Another variety of *syncopation,* very commonly met, occurs when, in one *clef* or *part,* the notes are regular in their rhythmical position, and, in the other *clef* or *part,* commence at the middle of each note in the first *clef* or *part,* being prolonged to the middle of the next. This variety of syncopation does not always interfere with the regular accent belonging to the *measure.* In the annexed example, taken from a piano score, we will see that the eighth note, which begins the first *measure* in the *bass clef,* is simultaneous through one-half its time with a sixteenth *rest* in the *treble.* The eighth note beginning the first measure of the *treble,* therefore, begins 1-16 from the start, involving that the last note of the bar be a sixteenth note, in order to complete the time.

The Tie.—This example shows the *tie,* which often occurs in simple pieces, and indicates briefly that the notes joined by it, if representing the same tone, are to be played, not separately as written, but by one note held down for the full period indicated. If, for example, we have a piece written in 6-8 time, in which three sixteenth notes, representing the same tone, are joined in a series of four, with a bar across their stems, the tie, written underneath them, means simply that the tone indicated is to be held down, while three of the sixteenth notes are counted. The reason for writing such notes in this manner, different from that in which they are played, is to maintain the unity of the time indicated in the signature. With the piano or organ, such a tone is held down for the required period, but with the violin or mandolin it must be constantly sounded.

SYNCOPATED PASSAGE AND TIE



THE SLUR, GROUPS OF NOTES.—A mark similar to the *tie*, thus given, is used to indicate several other musical variations. As shown in the accompanying diagrams, we have the arc-shaped line, known as a *slur*, to indicate groups of notes. In indicating the groups known as *triplets*, the *slur* is drawn over three notes with a figure 3 beneath—occasionally, also, the figure 3 alone is used. With notes written, as in the example, with the signature giving 2-4 time, we would count "two" for the measure, playing the *triplets*, or three slurred notes, in even time with the three quarter notes in the *bass*. A precisely similar notation is used to indicate sextolets, a figure 6 inside the slur, indicating, as in this example, that six notes are to be played in the time of four. In both cases the *slurred* notes are to be played smoothly and in unbroken sequence.
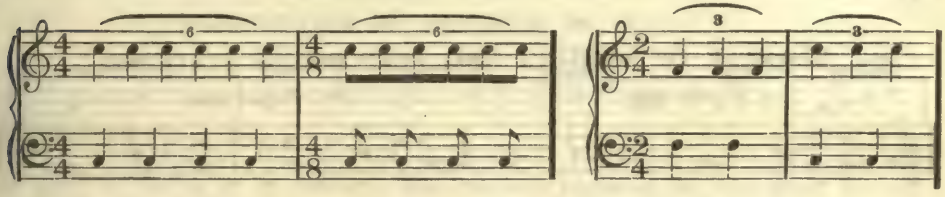
If these sextolets are to be played divided, as in the next figure, we must always divide them two and two, never three and three: this rule is invariable. In the following example the groups should be divided as if they were in 9-8 time, the accent falling on the rest, *G* and *A*, and not on *C*. In accenting the *C* above *middle C*, the groups here shown would become simply *double triplets*, and not sextolets. Such a measure as this must always be accented as evenly as possible, without violating the given time.

Other similar combinations of slurred notes are indicated in the accompanying diagram; the first indicating seven to be played in the time of four; the second, ten to be played in the time of eight, etc.
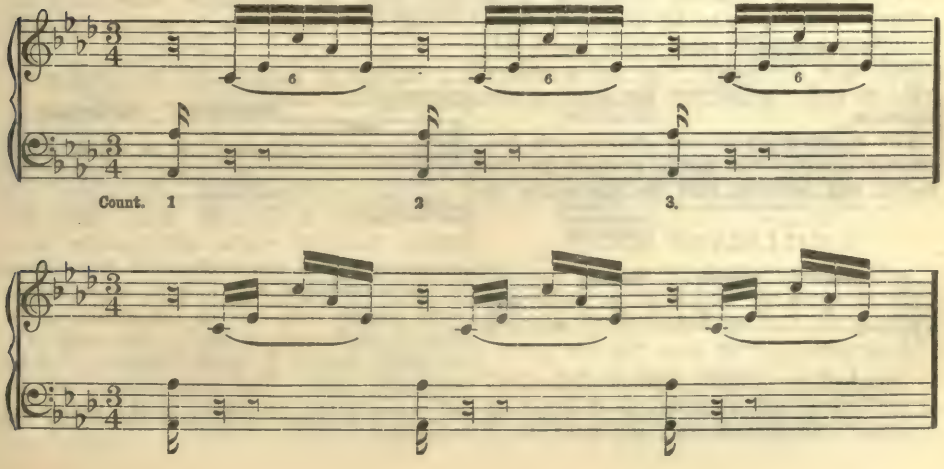
LEGATO PASSAGES.—The *slur* placed over, or under, any combination of notes on different lines and spaces signifies that they must be performed smoothly and connectedly, as in the groups already noticed. This notation is known as *legato*, signifying "bound or united."

STACCATO PASSAGES.—The opposite of *legato* is the movement known as *staccato*, signifying "marked and distinct," and represented by a *dot* placed immediately above or below the head of a note. The effect is that each tone is to be played,

SEXTOLETS AND TRIPLETS



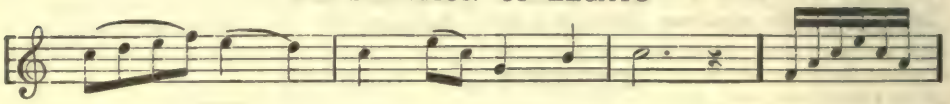
EXAMPLES OF SEXTOLETS



LIGATURED GROUPS OF NOTES
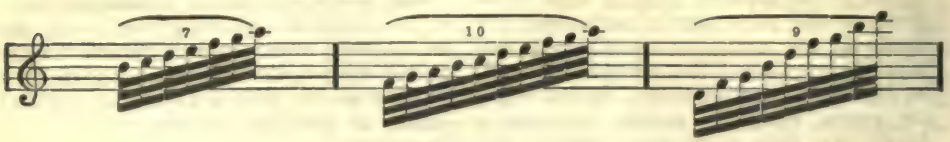


ILLUSTRATION OF LEGATO
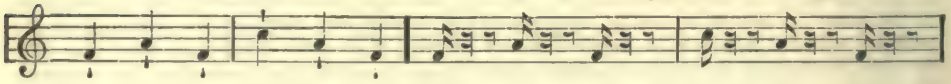


EXAMPLE OF WRITING AND PERFORMING STACCATO

Written thus: Played thus:



DOUBLE STACCATO, AS WRITTEN AND PLAYED

Written thus: Played thus:
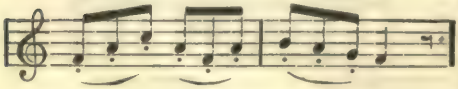


as if entirely detached from others, so that there is a marked interval between each sound, which amounts virtually to a *rest.* Thus, if three *crotchets* in a measure are marked *staccato,* they are to be played like three *quavers,* each followed by a *quaver rest.*

When the note is marked with a small point, instead of a *dot,* it indicates that the playing is to be particularly short and distinct. Thus, a measure containing three pointed *crotchets* is to be played as three *semiquavers* of the same tones, each followed by a *semiquaver rest* and a *quaver rest,* in order to fill out the time of the measure.

The signs of *legato* and *staccato* are frequently combined in music written for the violin, and indicate that the tones are to

DEMI-LEGATO NOTES



be detached by so many distinct movements of the bow in one direction, be it either up or down. Since these *dots* and *slurs* are of almost constant occurrence, they rank among the most important things that the student must thoroughly master at the beginning of his studies.

Abbreviations in Writing Music.—In order to simplify the writing of music, a number of abbreviations are commonly used, particularly where successions of similar notes are required. These occur frequently in scores for various instruments, and must be thoroughly understood, although not more than a passing mention

WHOLE NOTE IN EIGHTHS



is necessary to describe them. For example, when a whole note occurs in a *measure,* with a single diagonal dash above it, the meaning is that it is to be played as eight eighth notes, as in the example. A double dash over a whole note indicates, similarly, that it is to be played as sixteen sixteenth notes. The same rules apply to all other notes, as shown in the following examples.

INDICATIONS OF REPEATED NOTES



When a series of similar notes, as a *scale* or *trill*, is to be repeated a certain number of times the repetition is indicated by diagonal dashes, shown in the accompanying figures. This sign is used very largely in writing music for the violin and mandolin, and is repeated as many times as the written *scale* or *trill* is to be repeated; thus greatly simplifying the notation. In every case, however, the rule requires that the tones, repeated by this sign, should always have precisely the same value as the notes written down.

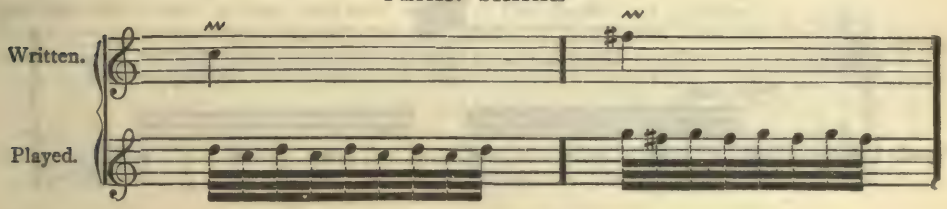
REPETITIONS OF DEFINITE MOVEMENTS
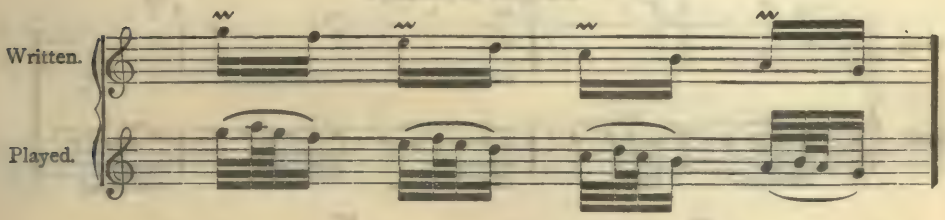


SHAKES AND TRILLS.—Another familiar abbreviation used in instrumental music is the *shake* or *trill*, which, placed over a note, indicates that it is to be played as a succession of notes to its full time-value. When the sharp waved line is written over a note, as shown in the accompanying figure, it is played as a *trill* of two notes; the tone above being sounded first, and then the marked tone, very quickly and in rapid succession. When this mark is on one of two notes with their stems connected with a bar, the trill is to be played by sounding the tone marked, the tone above it, the tone marked again; then the second of the two *written* tones, as in the example. The first *shake* is known as the *plain shake*, the second as the *passing shake*.

The so-called *turned shake*, or *trill*, is indicated and played as in the following example; always beginning as the *plain shake*, with the tone above that written and ending with the tone written, so as to join to the other notes in a measure. *Shakes* and *trills* are among the principal embellishments used in the music for stringed instruments. They should be carefully played in time, and not used so frequently as to involve loss of their effect.

PLAIN SHAKE

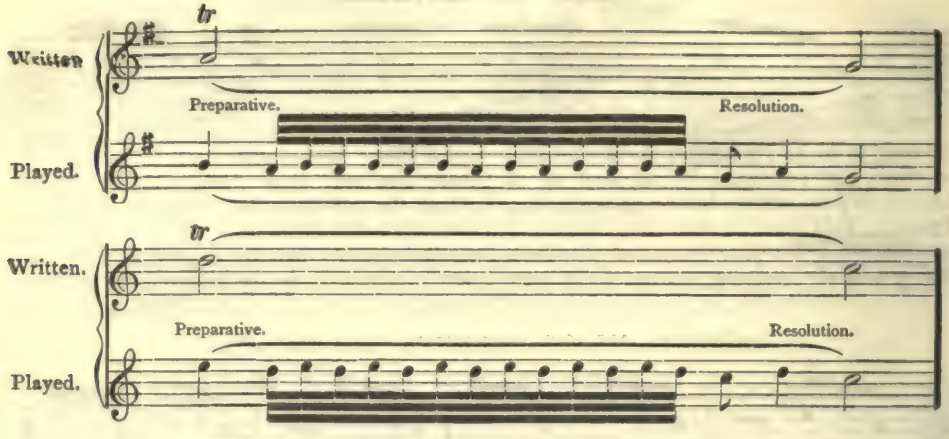


PASSING SHAKE
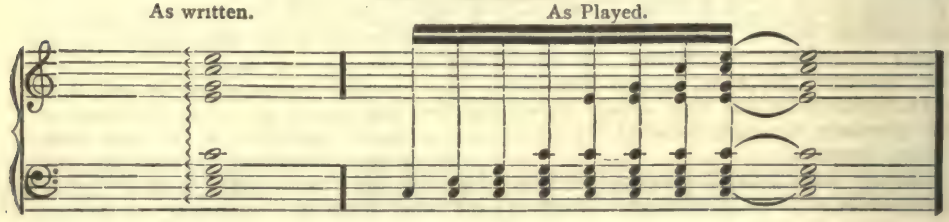


THE ARPEGGIO.—The familiar abbreviation known as *arpeggio* is a chord preceded
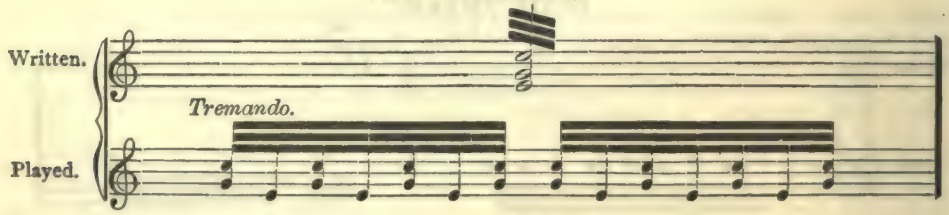
EXAMPLES OF TRILL



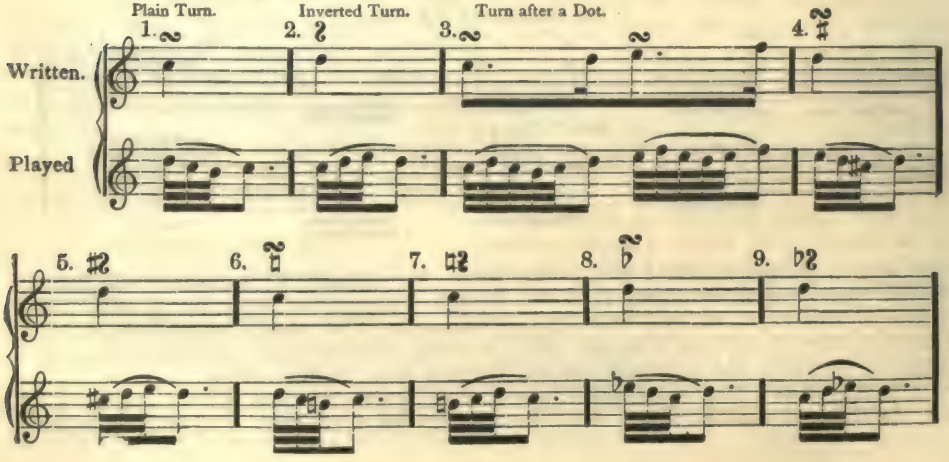
THE ARPEGGIO



THE TREMANDO



EXAMPLES OF THE GRUPETTO OR TURN



by a waved line, as in the accompanying example from the piano score. As indicated, it is to be played by striking the lowest tone first; then, that tone with the one next above; then three tones together, etc., until the entire chord has been played progressively. Each chord thus struck must be played very quickly, and, when the sequence is played, the full chord must be held down until the value of a whole note has been counted. Another form of *arpeggio* is shown in the accompanying example, in which the repetition of a trill is indicated by the tones composing it, written as a chord; their common stem being crossed by bars.

THE TURN.—The last form of abbreviations that requires notice is that known as the *turn*, which is indicated by a figure resembling a reversed *S;* either laid on its side, to give the *plain turn*, or standing upright, to give the *inverted turn*. The difference between the two is simple and readily explained, since, for all the various combinations, as shown in the accompanying examples, but one sequence of tones is recognized for each variety. When the note is marked with a plain turn the sequence is played thus: A series of three notes of 1-4 value of the note written, formed by the tone above that written, the tone written, the tone below, and, second, the tone written with the note with one-half of the value given. With the inverted turn the sequence is simply reversed; consisting in playing the tone below, the tone written, the tone above, and ending with the tone written at one-half time. When a *turn* is placed over a note joined by bars to the stem with other notes, the succession indicated is to be played by four notes of one-quarter the value of that written. A *turn* written with a *sharp* sign involves that the tone below that written shall be *sharped*, when sounded. A turn written with a *flat* sign indicates that the tone above that written shall be *flatted*, when sounded. The *turn* is sometimes written with grace notes giving proper combinations with the written tone at full size, but the sequence is always played with the proportional time indicated in the accompanying figures.

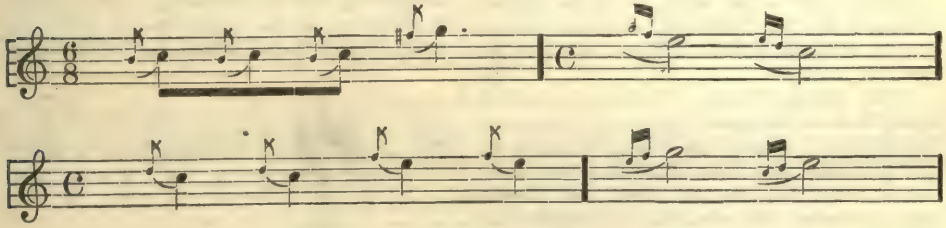
The final forms of embellishments used in musical notation is that known as the *grace note* or *appoggiatura*. This is usually a small note reversed and added to the regular notes in the bar for the purpose of giving expression to the piece or relieving the effect of too great uniformity. Very frequently the *grace note* is in value about one-half of the note it precedes; although this matter is determined largely by the use it is intended to serve, and the kind of piece in which it is written.

In general, there are two varieties of *grace notes:* the *greater* and the *lesser*. The effect of the former is to reduce the time of the note which it precedes. The *lesser appoggiatura* is written as a small note of one-half value, before any of regular size. Thus, a *quaver* before a *crotchet* indicates two *quavers*.

As a general rule, when the *grace note* is to be played with particular rapidity—instead of varying the performance from the written score—it carries a small cross on its stem.

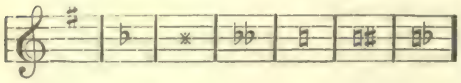
The *double appoggiatura*, so called, consists of two notes connected by bars written before the regular notes of a measure, and to be played in a light and collected manner. It may be understood that the effect produced is similar to that given by the *turn*, as shown in the accompanying diagram. The *turn* is frequently indicated by three small or *grace notes*, placed in regular order before and after the regular notes. This arrangement is occasionally known as *choice notes*, and always indicates that the combination is to be played as indicated in the diagram.

EXAMPLES OF APPOGGIATURA OR GRACE-NOTE



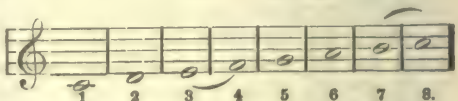
THE SIGNS OF TONE MODIFICATION.—In beginning the study of the musical scale it is desirable to fully understand the various

characters used in writing music. These are the signs for the *sharp* (♯), the *flat* (♭), the *double sharp* (×), the *double flat* (♭♭), and the *natural* (♮). They may be written in the *signature* at the beginning of a *staff*, or before any single note at any place on the staff. The effect of placing a *sharp* sign before any note on the *staff* indicates that it is to be raised a semitone. Thus, this sign before C, D, F, G, or A indicates that a black note on the piano or organ is to be sounded, but, if written before E, it indicates that F is to be sounded, and, if before B, that C is to be sounded. Similarly the *flat* sign before any note on the *staff* indicates that it is to be lowered a semitone. Thus, before D, E, G, A, and B, it indicates a black note on the piano or organ; but before F it indicates E, and, before C, it indicates B. The signs for *double sharp* and *double flat* are less often met. The first, however, raises the note a whole tone; the second lowers it a whole tone. Thus, a *double sharp* sign before C, D, F, G, A indicates, respectively, D, E, G, A, B; before B it indicates C♯, and before D it indicates F♯. The *double flat* sign similarly lowers the note a whole tone.
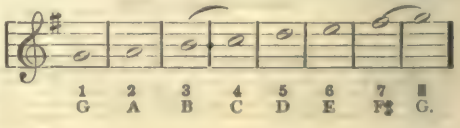


Placed before C, it gives B♭; before F, it gives E♭. The *natural* sign contradicts a *flat* or *sharp* indicated in the *signature*, calling for the *natural* tone. It also restores the single *flat* or *sharp* after the *double* sign in either case. Whenever a sharp is placed before the last note of a *space* or *measure*, the same note is to be played *sharped* in the following *measure*, unless on its next occurrence it is preceded by the *natural* sign.

THE MAJOR SCALE.—The *major scale* is composed of five whole tones and two semitones; every *major scale* being constructed on precisely this principle. The two semitones occur between the third and fourth, and between the seventh and eighth *degrees* of the scale, either in ascending or descending; the *degrees* being counted from the lowest tone upward. The *scale* of C is called the *model* or *natural scale*, because all of its tones are whole tones and naturals; being produced entirely by the white keys on the piano or organ. As shown in the accompanying diagram, the semitones occur between E and F, and between B and C, or between three and four, and seven and eight, as already indicated. The different tones, or *degrees*, of the *scale* are regularly named, as follows: the first is called *one*, or the tonic; the second, *two*, or *supertonic;* the third, *three*, or *mediant;* the fourth, *four*, or *subdominant;* the fifth, *five*, or *dominant;* the sixth, *six*, or *submediant;* the seventh, *seven*, or *leading note;* the eighth, *eight*, or *octave*. As may be seen, there are but seven tones in the



major scale, the *eighth* being the same as the *first*, except that it is an octave higher in ascending, or an octave lower in descending.

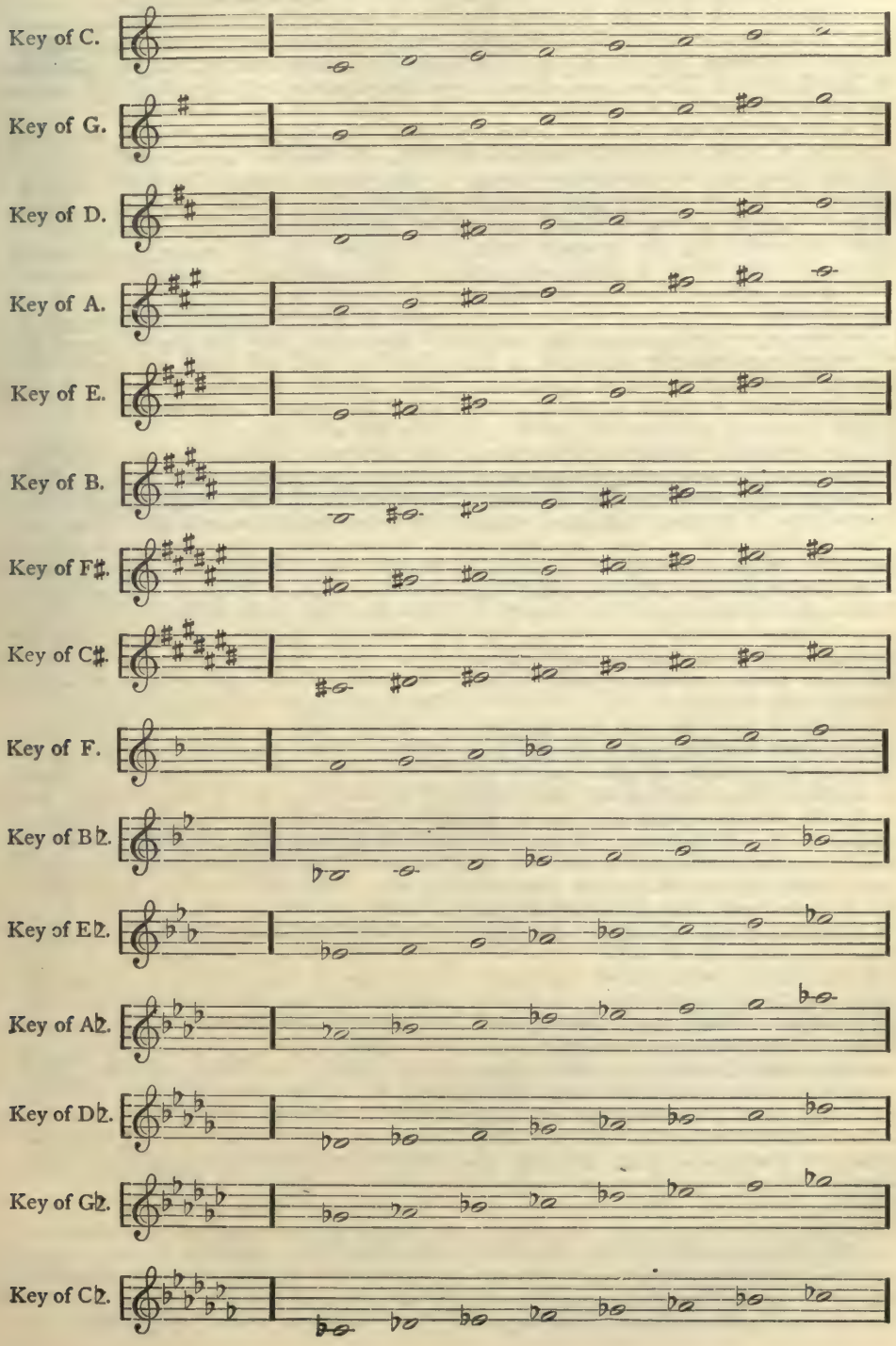
The *major scale* may be formed with any other tone, natural or accidental, as its first and eighth, but it must invariably have the semitones between the third and fourth and the seventh and eighth degrees, which involves that certain notes must be sharped, in order to produce the correct effect of the regular sequence of sound. Thus, the *scale* of G, shown in the accompanying diagram, has the second semitone between six and seven, or between E and F, when composed only of natural tones. Therefore, in order to make the sequence of tones correct, the seventh *degree*, or F, must be *sharped*. This simple principle enables the transposition of the *scale* without trouble to the trained musician, when transposition becomes necessary, as, for example, when accompanying the piano on the cornet. Remembering that all ascending intervals must be between whole tones, except those between the third and fourth, and the seventh



and eighth degrees, enables the ready construction of a *major scale* in any key.

THE SEQUENCE OF MAJOR SCALES.—The easiest clew to the formation of the various *major scales*, beginning with C, is to form each succeeding *scale* a fifth higher or a fourth lower; or, more correctly speaking, on the seventh semitone *after* the tonic of the previous scale, counting upward, or, on the fifth semitone *after* that same tone,

THE MAJOR SCALES AND SIGNATURES



counting downward. Thus, we have the regular succession of *major scales* from C as follows: G, D, A, E, B, F♯, C♯. The scale of G has one sharp, F; D has two, F and C; A, three, F, C, G; E, four, F, C, G, D; B, five, F, C, G, D, A. Similarly the scale of F flat has six sharps, F, C, G, D, A, E; and the scale of C flat seven, F, C, G, D, A, E, B. In each successive key the last *sharp* sign at the signature always corresponds to the *seventh degree* of the scale in that key, as may be readily understood on examining the annexed scales. These scales are shown as played and with their proper signatures in the accompanying diagrams.

Formation of Signatures.—The matter of scales is exceedingly important to the correct writing and playing of music, since any composition written in a given key, like a scale beginning with any one tone in this list, is invariably played with the notes belonging to that *scale* only, and introduces variations from these, as embellishments, for the sake of harmony and other effects. Thus, a piece with a clean signature is said to be written in the key of C; one with F *sharped*, in the key of G; one with F and C *sharped*, in the key of D; one with F, C, and G *sharped*, in the key of A, etc., according to the scheme of the *major scales* and their proper *signatures* given in the accompanying diagrams.

In view of what has just been said, the student must carefully notice that the first *sharp* at the *signature* is placed on F, the second on C, the third on G, the fourth on D, the fifth on A, the sixth on E, the seventh on B. Furthermore, C♯ never occurs at the signature without the F♯; G♯ never occurs without F♯ and C♯ preceding it; D♯ never occurs without the F♯, C♯, and G♯ preceding it, etc., throughout the entire list.

Major Scales with Flats.—The *major scales* may be written with *flats*, as well as with *sharps*, as shown in the accompanying diagrams. The rule, in forming the proper sequence from C, is to make each successive *scale* on the tone, either three and a half tones above or four and one-half tones below; which is to say, on the fifth semitone *after* the previous *tonic*, counting upward, or, on the seventh semitone *after* it, counting downward. This rule gives the following: C, F, B♭, E♭, A♭, D♭, G♭, C♭ (or B). The signatures of the other keys and scales show the first flat on B, the second on E, the third on A, the fourth on D, the fifth on G, the sixth on C, the seventh on F. As with the *sharps*, this sequence of *flats* at the signatures is always invariable; no one *flat* occurring without those regularly preceding it in the above-named sequence. Furthermore, the last *flat* sign at the signature of any given key always corresponds to the *fourth degree* of its scale. The *sharps* are added by ascending fifths, the *flats*, by ascending fourths.
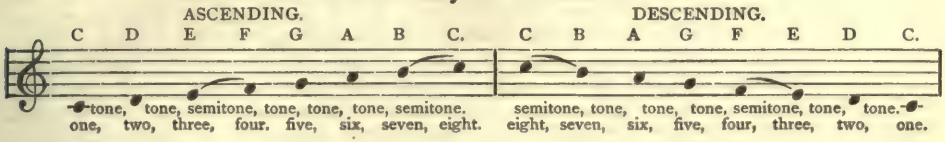
The Minor Scale.—The *major scale* of every key has a relative *minor scale* having the same signature. The *minor scale* is constructed like the *major scale*, except that, in ascending, the semitones always occur between the second and third, and between the seventh and eighth *degrees;* while, in descending, they are always found between the fifth and sixth, and second and third *degrees*, counting from the lowest note. The relative *major* and *minor scales* have the same signatures. The characteristic difference between the two is in the nature of the interval from the first to the third note of the scale. When that interval forms two whole tones—which is to say, a "*major third*"—the scale, or mode, is *major*. Thus, the scale of C *major* has the first three degrees, C, D, E, constituting an interval of two whole tones *after* the *tonic*. If, however, the interval consists only of a tone and a semitone—which is to say, a "*minor-third*"—the scale or mode is *minor*. Thus, the *minor* scale beginning with C—it is the relative *minor* of E♭ *major*, signature three flats—has the first three notes, C, D, E♭, constituting an interval of one tone and a semitone *after* the first. The difference between the *major* and *minor* modes on any *tonic* is well illustrated by the respective *major* and *minor* chords. Thus, CEG is *major*, while CE♭G is *minor*.

Deriving Relative Minor Keys.—In order to find the relative *minor* of any given *major* key or *tonic*—which is to say, the scale having the same signature, save for the accidental semitones between the *seventh* and *eighth degrees*, in ascending—the rule is to take the note three semitones below the *tonic* of the *major* scale, as the *first degree* of the *minor* scale. The ascending scales may then be formed by observing the rules regarding the positions of the semitones, as already given.
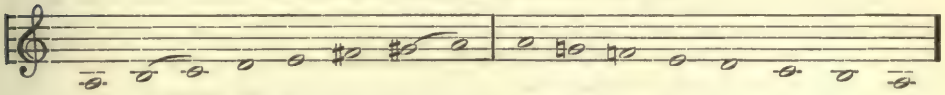
Varieties of Minor Scale.—On the basis of several variations, in both ascending and descending, three varieties of *minor scale* are recognized by musicians: the *harmonic*, the *melodic*, and the *combined*.

The *harmonic minor* scale raises its
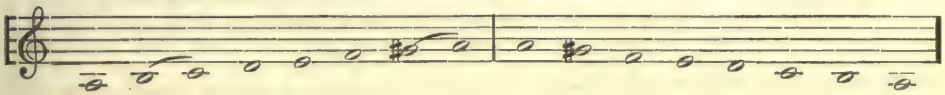
DIATONIC MAJOR SCALE OF C.



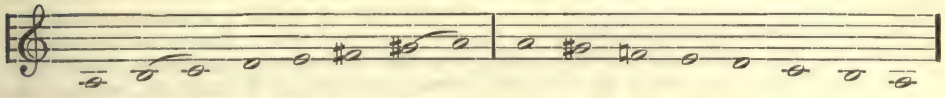
MELODIC MINOR SCALE OF A.



HARMONIC MINOR SCALE OF A.



COMBINED MINOR SCALE OF A.



seventh degree one semitone, in both ascending and descending.

The *melodic minor* scale raises its *sixth* and *seventh degrees* each one semitone in ascending, and restores them both in descending. Thus, the *melodic minor* scale of A, which is the *relative* of C *major*, and is written with the same signature, has the *sixth* (F) and *seventh* (G) *degrees* sharped in ascending, but has both natural in descending. In this manner, although there is a whole tone between the *seventh* and *eighth* in descending, the semitone is preserved between the *sixth* and *seventh*, according to the rule already given.

The *combined minor* scale is like the *melodic* form in ascending—having both its *sixth* and *seventh degrees* raised one semitone. It is, however, like the *harmonic* form in descending—having the *sixth degree* one semitone above the *fifth*, or *restoring* it, as in the *melodic* scale. The *seventh degree*, however, is always one semitone lower than the *eighth*. It thus preserves the semitone between the *fifth* and *sixth*.

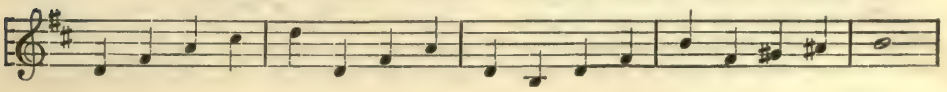
These rules are applicable in all *minor scales*. Therefore, in writing a musical composition in the key of D, with two *sharps*, the relative *minor* B may be introduced, as desired, by using the *minor* semitones, as in the following examples.

By using the *sharp* signs before the notes in the last measure, the key of D is still maintained. This key, as we have already seen, involves that the scale should be D, E, F♯, G, A, B, C♯; with the relative *minor* as B, C♯, D, E, F♯, G♯, A♯, B; which, in descending, again gives B, A♯, G, F♯, E, D, C♯, B. These rules apply in all minor scales.

THE CHROMATIC SCALE.—The so-called *chromatic scale* is formed by twelve consecutive semitones upon any degree of the *major* or *minor*. In other words, it is formed by adding to the seven principal tones of the *major* or *minor scales* the remaining five semitones. The construction of the chromatic scale of C is indicated in the accompanying diagrams; the notes having the *sharps*, or signs of elevation in ascending, and the *flats*, or signs of depression, in descending.

CHORDS.—In closing this brief review of the rudiments of music, it seems desirable to add a few words regarding the forma-

KEY OF D, WITH RELATIVE B MINOR
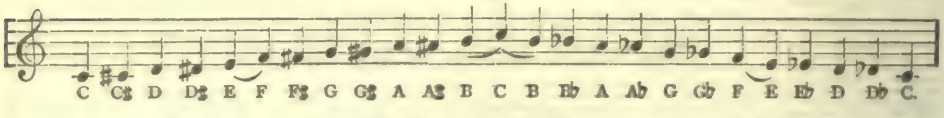


tion of chords; since this will be a matter of considerable importance in later stages of study. The formation of chords depends immediately upon the construction of the scale. Thus, in any given key or scale, it is found that certain combinations of notes form a pleasing and harmonious effect, fitting into the melody of the piece, without introducing any suggestions of another key. Certain other chords, while not actually displeasing, are less suitable for musical purposes, and are seldom, if ever, used.

The construction of chords proceeds on intervals of the *scale;* each chord being named according to the *degree* of the scale, upon which it is constructed. An *interval* has already been defined as the distance between two natural tones, or between two whole tones, on all but two *degrees* of the *scale.* Thus, the distance from one white key to another on the piano keyboard is an *interval.*

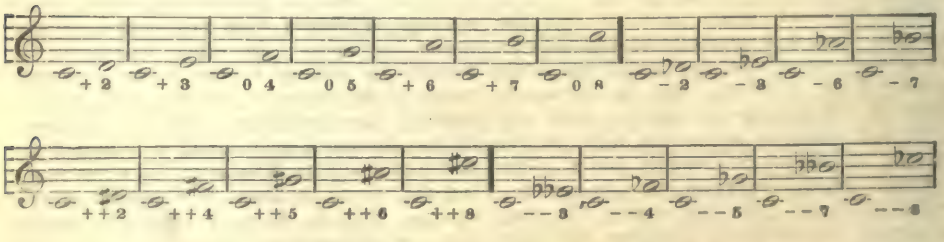
INTERVALS.—In discussing the subject at the present time, we may define an interval as the "distance between two *degrees* of a scale," reckoning from the lower or higher of the two notes containing it and counting the first as *one.* Thus, the interval from C to E is a *third,* and that from C to G is a *fifth.* In the construction of scales, intervals may be divided into five classes: *perfect* (O), *major* (+), *minor* (—), *augmented* (++), and *diminished* (——). These are used in the formation of chords, according as the *mode* is *major* or *minor,* and may be briefly defined as follows: a *major interval* and a *minor interval* correspond to the descriptions already given, the *major* being a semitone larger than the *minor,* and the *minor* being a semitone smaller than the *major.* In order to avoid confusion in terminology, the term *perfect* is substituted for *major* on three intervals or degrees of the *scale,* the *fourth, fifth,* and *eighth.* These *perfect intervals* correspond to the *major scale,* in which

CHROMATIC SCALE.



there is always a *perfect fourth, fifth,* and *eighth,* and a *major second, third, sixth, seventh,* and *ninth.* An *augmented interval* is one that is raised a semitone above the *major interval* and a *diminished interval* is one that is lowered a semitone below the *minor interval.* All intervals, except the *second, sixth,* and *ninth,* may be *diminished;* and all, except the *third, seventh,* and *ninth,* may be *augmented.* There may also be a *major* or a *minor second, third, sixth, seventh;* the *fourth, fifth,* and *eighth intervals* never being distinguished by these terms. To be brief, the *second* may be *major, minor, augmented;* the *third, major, minor, diminished;* the *fourth* and *fifth, perfect, augmented, diminished;* the *sixth, major, minor, diminished;* the *seventh, minor, diminished, augmented;* the *eighth, perfect, augmented, diminished;* the *ninth,*

EXAMPLES OF VARIOUS INTERVALS



major or *minor.* By understanding the relation of these terms to the major scale, all intervals may be readily formed.
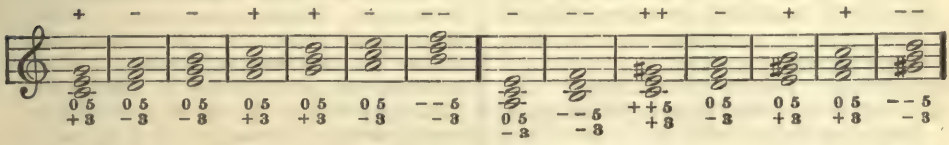
In the formation of chords of any number of notes, the component tones, being properly in one scale or key, are designated as *degrees.* The *intervals* of a chord may be consecutive or inverted. An *interval* is said to be "inverted" when its lower *degree*

is transferred an octave higher, or its higher *degree* is transferred an octave lower. By inversion, *perfect intervals* remain *perfect.* This is evident, since, as may be readily discovered, the *fourth, fifth,* and *eighth,* either above or below, are always exactly the same number of semitones from the fundamental. This is true of no other intervals. By inversion, however, *major intervals* become *minor;* the *minor* become *major;* the *diminished* become *augmented,* and the *augmented* become *diminished.*

The simplest kind of a musical chord is the triad, which is a combination of three different tones; the lowest being called the *fundamental,* and the other two being its *third* and *fifth.* The most common chords in the *major* mode are formed on the *first, fourth,* and *fifth degrees.* To form satisfactory chords on the other *degrees,* the notes must be modified, according to the position.

There are, thus, four kinds of triads: *major, minor, diminished,* and *augmented.* The *major* triad consists of a *major third* above the *fundamental,* with a *minor third* above it, or, of a *major third* and a *perfect fifth.* A minor triad consists of a *minor third* and a *major third* above it, or of a *minor third* and a *perfect fifth* above the *fundamental.* A *diminished triad* is made of two *minor thirds,* or a *minor third* and a *diminished fifth.* A *diminished triad* consists of two *major thirds,* or a *major third* and an *augmented fifth.* Thus, as may be understood by what has already been said, the *first, fourth,* and *fifth triads* in every *major scale* are *major* triads; the *second, third, sixth* are *minor;* and the *seventh* is *diminished.* Also, in every *minor scale,* the *first* and *fourth* are *minor;* the *fifth* and *sixth* are *major;* the *second* and *seventh* are *diminished,* and the *third* is *augmented.* Triads may be formed upon either *major* or *harmonic minor scales;* the latter being almost the typical practice, as shown in the accompanying example. In this example we see also that the *second* and *fourth* triad of the *major scale* are the same, respectively, as the *fourth* and *sixth* of the *relative minor;* thus leaving only twelve possible triads in each key

CHORDS IN C MAJOR. CHORDS IN A MINOR.



ON PRACTICING

The following extract contains much useful information to guide the student in the necessary work of practicing, which is so great a part of musical education that too much space can not be given to it in any treatise on the rudiments of music:

"The common saying that 'practice makes perfect,' can not be definitely applied, from the fact that to merely devote a certain amount of time every day to the practice of the violin, piano, or any other instrument will not result in ability to correctly render the simplest form of music, should a lack of the right condition of the mind cause, as it always does, a failure of correct physical control; consequently, such a statement can only be made in a conditional point of view. If the pupil can not devote any more than an hour a day to practice, then it is better to divide the time, if possible, into two courses, as this brings the effect of each course of practice closer together, which has a good result. The scholar should be determined to observe every feature pertaining to the art, which will be complying with the necessary obligations indispensable to its acquirement.

"Trying to play tunes by ear is a great drawback to progress, and a waste of time, as these easy melodies can be quickly learned after sufficient practical ability shall have been acquired.

"One of the greatest faults, and consequently an obstruction to effective progress, is failing to practice exercises and lessons in the early period of the study in a slow degree of time, which gives the opportunity of detecting all apparent mistakes.

"The student must bear in mind that while he continues to be incapable of correctly performing the simplest grade of music, he will also continue to be incapable of correctly rendering music of a higher grade."

DICTIONARY OF MUSICAL TERMS

A. By, for.

ACCELLERANDO. Accelerating the movement.

ACCENT. Stress or force upon a tone. It is sometimes indicated by a sign, thus ∧.

ACCOMPANIMENT. The part added to the principal one by way of enhancing the effect of the composition.

ADAGIO. Very slow degree of movement.

ADAGISSIMO. Extremely slow.

AD LIBITUM. At will or discretion. It implies that the time of some particular passage is left to the pleasure of the performer, or that he is at liberty to introduce whatever embellishments his fancy may suggest.

AFFETTUOSO. Tender, affectionate.

AGITATO, or CON AGITAZIONE. With agitation, anxiously.

AL, or ALL, ALLA. To the; in the style of.

ALLEGREMENTE. With quickness.

ALLEGRETTO. Somewhat cheerful, but not so quick as *Allegro.*

ALLEGRETTO SCHERZANDO. Moderately playful and vivacious.

ALLEGREZZA. Joy; as, *Con Allegrezza,* joyfully, animatedly.

ALLEGRISSIMO. Extremely quick and lively.

ALLEGRO. Quick, lively. This term, implying a rapid and vivacious movement, is frequently modified by the addition of other words; as, *Allegro Agitato,* quick, with anxiety and agitation.

AL SEGNO, AL SEG, or the character 𝄋, signifies that the performer must return to a similar character in the course of the movement, and play from that place to the word *fine,* or to the mark 𝄐 over a double bar.

ANDANTE. A movement somewhat slow and sedate. This term is often modified, both as to time and style, by the addition of other words.

ANDANTINO. Somewhat slower than *Andante.*

ANIMATO, or CON ANIMA, or ANIMOSO. With animation, in a spirited manner.

ANNULAIRE. Third finger, or next to the little finger.

A QUARTRE MAINS. For four hands. For two performers on one pianoforte.

A PIACERE, or A PIACIMENTO. At the pleasure of the performer.

APPOGGIATURA. A note of embellishment usually written in a small character.

APPOGGIATO. Dwelt, leaned upon.

ARIA. Song or air.

ARIOSO. In the style of an air.

ARPEGGIO, or ARPEGGIANDO, or ARPEGGIATO. Passages formed of the notes of chords taken in rapid succession, in imitation of the harp, are said to be in *arpeggio.*

ASSAI. Very, extremely. This adverb is always joined to some other word, of which it extends the signification; as, *Adagio Assai,* very slow; *Allegro Assai,* very quick.

A TEMPO, or A TEM. In a regular time.

A TEMPO GIUSTO. In strict and equal time.

ATTACA, or ATTACA SUBITO, implies that the performer must directly commence the following movement.

BALLAD. A short and familiar song.

BARCAROLLE. Songs of the Venetian gondoliers or boatmen.

BEN. Well; as, *Ben Marcato,* well marked. This expression indicates that the passage must be executed in a clear, distinct, and strongly accented manner.

BEN TENUTO. Held on, fully sustained.

BIS. Twice. This term indicates that a certain passage, distinguished by a curve drawn over or under it, must be performed twice.

BRILLANTE. Showy and sparkling style of performance.
BRIO, or BRIOSO, or CON BRIO. With brilliancy and spirit.
BRISE. Sprinkled, broken into arpeggios.

CADENCE. A close in melody or harmony; an ornamental and extemporaneous passage introduced at the close of a regular composition.
CALANDO. Gradually diminishing in tone and quickness.
CALORE. With much warmth and animation.
CANONE. Canon or catch for several voices or instruments.
CANON. Interrupted imitation.
CANTABILE. In a graceful and singing style.
CANTANTE. The part to be executed by the voice.
CAPELLA, ALLA. In the church style.
CAPO. The head, or beginning.
CAPRICCIO. Fanciful and irregular species of composition.
CAVATINA. An air of one movement or part only, occasionally preceded by a recitative.
CHANT. A song or melody; the vocal part.
CHE. Than; as, *Poco piu che andante*, rather slower than *andante*.
CHROMATIC. Proceeding by semitones, or formed by means of semitones.
CODA. A few bars added at the close of a composition, beyond its natural termination.
CON. With; as, *Con espressione*, with expression; *Con brio*, with brilliancy and spirit.
CONCENTO. Concord, agreement: a selection of pieces is sometimes so called.
CONCERTO. A composition intended to display the powers of some particular instrument, with orchestral accompaniments.
CON DOLCEZZA. With sweetness.
CON DOLORE. Mournfully, with pathos.
CON GRAVITA. With gravity.
CON GRAZIA. With grace.
CON GUSTO, GUSTOSO. With taste.
CON IMPETO. With impetuosity.
CON MOTO. In an agitated style; with spirit.
CON SPIRITO. With quickness and spirit.
COUNTERPOINT. The art of composing music in harmonious parts which have individuality.
CRESCENDO, or CRES. With a gradually increasing quantity of tone.

DA. By.
DA CAPO, or D. C. From the beginning; an expression which is often written at the end of a movement, to indicate that the performer must return to and finish with the first strain.
DAL. By; as, *Dal Segno*, from the sign; a mark of repetition.
DECRESCENDO. Gradually decreasing in quantity of tone.
DELICATEZZA. Delicacy; as, *Con Delicatezza*, with delicacy of expression.
DELICATO. Delicately.
DIATONIC. Naturally; that is, according to the degrees of the major or minor scale, or by tones and semitones only.
DILUENDO. The gradual dying away of the tone until it arrives at extinction.
DIMINUENDO, or DIM. Implies that the quantity of tone must be gradually diminished.
DI MOLTO. This expression serves to augment the signification of the word to which it is added; as *Allegro di molto*, very quick.
DIVERTIMENTO. A short, light composition, vocal or instrumental, written in a familiar and pleasing style.
DOLCE, or DOL. A soft and sweet style.
DOLCEZZA, or CON DOLCEZZA. With softness and sweetness.
DOLCEMENTE. Played in a sweet and graceful style.
DOLOROSO. A soft and pathetic style.
DOMINANT. The fifth note of any scale.
DOPPIO. Double.
DOUCE. Sweet, soft, harmonious.
DOUX. Sweet, soft.
DROITE. Right.
DUR. Major, in relation to modes and keys.
DYNAMICS. That department of music wich treats of the power or force of tones.

E, or ED. The Italian conjunction *and;* as, *Flauto e Violino*, flute and violin; *Nobilimente ed Animato*, with grandeur and spirit.
ELEGAMENTE or ELEGANTE. Written or played with elegance.
ELEGANZA. With elegance, gracefully.
ENERGICO, or CON ENERGIA, or ENERGICAMENTE. With energy.
ESPRESSIVO, or CON ESPRESSIONE. With expression.
ESTRAVAGANZA. Extravagant and wild as to composition and performance.
ETUDE. A study.
EXTEMPORE. Without previous composing, unpremeditated.

FACILITA. A facilitation, an easier adaptation.

FANTAISSIE, or FANTASIA. A species of composition in which the author gives free scope to his ideas, without regard to those systematic forms which regulate other compositions.

FINALE. The last piece of any act of an opera, or of a concert; also the last movement of a symphony or sonata, in the German style.

FINE. The end.

FORTE, or FOR., or *f.* Loud.

FORTISSIMO, or *ff.* Very loud.

FORZANDO, or FORZ., or *fz.* Mark the note with peculiar emphasis or force.

FUGUE. A contrapuntal composition in which a subject proposed by one part is imitated by the others in accordance with certain laws.

FUOCO, CON. With intense animation.

FURIOSO, or CON FURIA. With fire.

GAIEMENT. In a cheerful and lively style.

GALLOPADE. A galop; a quick German dance tune.

GALOP, or GALOPPE. A quick species of dance, generally in 2-4 time.

GAUCHE. Left.

GIUSTO. In just and exact time.

GLISSANDO. A rapid sliding over the white keys with the nail; a movement of the hand up the string of a violin or other stringed instrument, producing all the tones in succession.

GRACES. Occasional embellishments frequently indicated by the composer, sometimes spontaneously introduced by the performer. The most important of these are the *Appoggiatura*, the *Turn*, and the *Shake*.

GRANDIOSO. Written or played in a grand and elevated style.

GRAN GUSTO. In an elevated and grand style.

GRAVAMENTE. Dignified and solemn.

GRAVE. The slowest degree of movement; also, a deep, low pitch in the scale of sounds.

GRAVITA. Gravity; as *Con Gravita*, with gravity.

GRUPPETTO. A group of notes; a turn.

GRUPPO. A turn, or grace.

GUSTO, GUSTOSO, or CON GUSTO. With taste, elegantly.

HARMONY. The science of chorus.

HOLD. A character (thus, 𝄐) indicating that the tone or silence may be prolonged.

IL. The.

IMITAZIONE. An imitation.

IMPETUOSO. With impetuosity, impetuously.

IMPROMPTU. An extemporaneous production.

IMPROVISAIRE. To compose or sing extemporaneously.

IN. In; as, *In tempo*, in time.

INNOCENTE, or INNOCENTEMENTE. In an artless and simple style.

INTERLUDE. An intermediate strain or movement.

INTERVAL. The difference of pitch between two tones; the distance between two degrees of the natural scale.

INTRADA, or INTRODUZIONE. A short introductory movement.

ISTESSO. The same; as, *Istesso tempo*, the same time.

LARGHETTO. A time slow and measured in its movement, but less so than *Largo*.

LARGHISSIMO. Extremely slow.

LARGO. A very slow and solemn degree of movement.

LEGATO. In a smooth and connected manner.

LEGATISSIMO. Exceedingly smooth and connected.

LEGEREMENT. With lightness and gayety.

LEGGIARDO. Light, gentle.

LEGGIERAMENTE. Lightly, gently.

LEGGIERO, or CON LEGGIEREZZA. With lightness and facility of execution.

LEGGIERISSIMO. With utmost lightness and facility.

LENTANDO. With increasing slowness.

LENTEMENTE, or LENTO. In slow time.

LIAISON. Smoothness of connection; also a bind or tie.

LOCO. This word implies that a passage is to be played just as it is written in regard to pitch: it generally occurs after 8va *alta*, or 8va *bassa*.

MA. But; as, *Allegro ma non troppo*, quick, but not too much so.

MAESTOSO. With majestic and dignified expression.

MAIN. The hand; as, *Main Droite, Main Gauche*, or *M. D., M. G.*, the right or left hand in piano music.

MARCATO. In marked and emphatic style.

MARCIA. A march.

MARZIALE. In a martial style.

MELANGE. A composition founded on several favorite airs; a medley.

MEME. The same; as, *Meme movement*, in the same tune.

MESTO. Mournfully, sadly, pathetically.

MESTOSO. Sadly, pensively.

METRONOME. An ingenious instrument for indicating the exact time of a musical piece by means of a pendulum, which may be shortened or lengthened at will.

MEZZO. In a middling degree or manner; as, *Mezzo forte,* rather loud; *Mezzo piano,* rather soft.

MEZZO CARATTERE. A moderate degree of expression and execution.

MINUETO. A slow, graceful dance; an air or tune in ¾ time; a movement of quicker time used as the conclusion of sonatas, etc.

MODERATO. With a moderate degree of quickness.

MODULATION. A transition from one key to another, brought about by the aid of one or more notes or harmonies which are common to the key left and that which follows.

MOLL. Minor, in relation to modes and keys.

MOLTO. Very, extremely; as, *Molto allegro,* very quick; *Molto adagio,* extremely slow.

MORCEAU. A short musical composition of any kind.

MORDENTE. A beat or transient shake.

MORENDO. Gradually subsiding in tone and time: dying away.

MOSSO. Movement; as, *Piu mosso,* with more movement, quicker.

MOTO, or CON MOTO. With agitation.

MOVIMENTO. Time, movement.

NOBILE, or NOBILEMENTE. With nobleness, grandeur.

NOTTURNO. A composition, vocal or instrumental, suitable for evening recreation, from its elegance and lightness of character.

O. Or; as, *Flauto o Violino,* flute or violin.

OBLIGATO, or OBLIGATI. Parts of a composition indispensable to its just performance, and which, therefore, can not properly be omitted.

OTTAVA, or 8VA. An octave. This word is generally joined with ALTA or BASSA: the first signifies that the passage to which it is applied must be played an octave higher than it is written; the second, that it must be played an octave lower.

OVERTURE. An introductory symphony to an oratorio or opera, consisting of several different movements.

PASSIONATE. In an impassioned manner.

PATETICO. Pathetically.

PATHETIQUE. Pathetic.

PASTORALE. A soft and rural movement.

PEDALE. A pedal or stationary bass. In piano music this term implies that the performer must press down the pedal which takes off the dampers.

PERDENDO, or PERDENDOSE, or PERDEN. A gradual diminution, both in the quantity of tone and speed of movement.

PEU. A little.

PHRASE. A short musical sentence containing an incomplete idea.

PIACERE. Will, pleasure; as, *A piacere,* that is, at the performer's pleasure in regard to time.

PIANISSIMO, or *pp.* Extremely soft.

PIANO, or *p.* Soft.

PIU. An adverb of augmentation; as, *Piu presto,* quicker; *Piu piano,* softer.

PLAINTIVO. Expressively, plaintively.

PLUS. More; as, *Plus anime,* with greater animation.

POCO. A little, rather, somewhat; as, *Poco presto,* rather quick; *Poco piano,* somewhat soft.

POCO A POCO. By degrees, gradually; as, *Poco a poco crescendo,* louder and louder by degrees; *Poco a poco diminuendo,* softer and softer by degrees.

POI. Then; as, *Piano poi forte,* soft, then loud.

POLACCA, or POLONAISE, or POLONOISE. A slow, Polish dance, in ¾ time, of a peculiar rhythmical construction, as the melodical members usually terminate on the third crotchet of the bar.

POMPOSO. In a grand and pompous manner.

PORTAMENTO. The manner of sustaining and conducting the voice; a gliding from one note to another.

POSSIBILE. Possible; as, *Piu forte possibile,* as loud as possible.

POTPOURRI. A fantasia upon favorite airs.

PRECIPITATO. In a hurried manner.

PRECISIONE. With precision, with exactness.

PRELUDIO. A prelude or introduction.

PREMIERE. First; as, *Premiere fois,* first time.

PRESTISSIMO. The most rapid degree of movement.

PRESTO. Very quick.

PRIMO. First; as, *Violino primo,* first violin; *Tempo primo,* in the first or original time.

QUADRILLE. A French dance.

QUARTET. A composition for four voices or instruments.

QUASI. In the manner or style of; as, *Quasi allegretto,* like an *allegretto.*

QUIETO. With calmness, with repose, quietly.

RADDOLCENDO, or RADDOLCENTE. With augmented softness.

RALLENTANDO. A gradual diminution in the speed of the movement, and a corresponding decrease in the quantity of tone.

RAPIDO. Rapidly.

RETARDANDO. Moving slower and slower.

RINFORZANDO, RINFORZATO, or RINF, or RF. With additional tone and emphasis.

RITENENTE, or RITENUTO. A keeping-back; a decrease in the speed of movement.

ROMANCE. A short, lyric tale; a musical composition suggesting a romantic narration.

ROMANZA. Set to music; or a simple and elegant melody suitable to such words.

RONDEAU, or RONDO. A composition of several strains or members, at the end of each of which the first part or subject is repeated.

SCHERZANDO, SCHERZANTE, SCHERZOSO, or SCHERZ. In a light, playful, and sportive manner.

SCHERZO. A composition in a playful or sportive style.

SEGO. A sign; as, *Al segno,* return to the sign; *Dal segno,* repeat from the sign.

SEGUE, or SEGUITO. Now follows, or, as follows; as *Segue il coro,* the chorus follows; *Segue la finale,* the finale now follows. It is also used to indicate *in similar* or *in like manner,* to show that a subsequent passage is to be played like that which precedes it.

SEMPLICE, or SEMPLICEMENTE. With simplicity, artlessly.

SEMPRE. Always; as, *Sempre staccato,* always staccato or detached; *Sempre forte,* always loud; *Sempre piu forte,* continually increasing in force.

SERIOSO. In a serious style.

SERPEGGIANDO. Gently and silently creeping onward, quietly advancing.

SFORZATO, or SFORZANDO, or SF. Implies that a particular note is to be played with emphasis.

SICILIANA. A movement of a slow, soothing, pastoral character, in 6-8 time, resembling a dance, peculiar to the peasantry of Sicily.

SINFONIA. A symphony or orchestral composition in many parts.

SLENTANDO. A gradual diminution in the time or speed of the movement.

SMORZANDO. A gradual diminution as to tone.

SOAVE. In a soft, sweet, and delicate style.

SOGGETTO. The subject or theme.

SOLI (plural of SOLO). Implies that two or more principal parts play or sing together. Such parts are never doubled.

SOLO, or SOLA. Alone.

SOLO. A composition, or even a passage, for a single voice or instrument.

SONATA, or SONATE. A composition consisting of several movements, generally for a single principal instrument, with or without accompaniments.

SOSTENUTO, or SOST. Sustained, continuous in regard to tone.

SPIRITO, or CON SPIRITO. With spirit.

SPIRITOSO. With great spirit.

STACCATO. Implies that the notes are to be played distinct, and detached from one another.

STESSO. Means *the same.*

SUBITO. Quickly; as, *Volti subito,* turn quickly.

SUITE. A series, a collection; as, *Une suite de pièces,* a series of lessons.

SYNCOPATE. In a constrained and syncopated style.

SYNCOPATION. The connecting the last note of one bar to the first note of the next, so as to form but one note of a duration equal to both: this displaces the accent and produces a peculiar effect.

TACET. Implies that during a movement, or part of a movement, some particular instrument is to be silent; as, *Flaute tacet,* the flute is not to play.

TANTO, or TON. Not so much; not too much.

TARDO. Slowly, in a dragging manner.

TEMA. A subject or theme.

TEMPESTOSO. In a tempestuous manner.

TEMPO COMODO. In a convenient degree of movement.

TENDREMENT. Affectionately, tenderly.

TENERAMENTE, TENERO, or CON TENEREZZA. Tenderly.

TENUTO, or TEN. Implies that a note, or notes, must be sustained or kept down the full time.

THEME. A subject.

TIMOROSO. With timidity and awe.

TRANQUILLO, TRANQUILLAMENTE, or CON TRANQUILLEZA. Tranquilly, composedly.

TREMENDO. With a tremendous expression, horribly.

TREMANDO, TREMOLATE, or TREMOLO. The reiteration of a note or chord with great rapidity, so as to produce a tremulous kind of motion.

TRILLANDO. A succession of shakes on different notes.

TRILLE, or TRILLO. A shake.

TRIO. A piece for three voices or instruments. This term also denotes a second movement to a waltz, march, minuet, etc., which always leads back to a repetition of the first or principal movement.

TRIPLET. A group of three notes, arising from the division of a note into three equal parts of the next inferior duration.

TUTTA FORZA. With the utmost vehemence, as loud as possible.

TUTTI (PLURAL, all). A term used to point out those passages where all the voices or instruments, or both, are to be introduced.

UN. A; as, *Un poco,* a little.

VALCE, or VALSE. A waltz.

VELOCE, or CON VELOCITA. In rapid time.

VELOCISSIMO. With extreme rapidity.

VIBRANTE. A peculiar manner of touching the keys of the piano.

VIGOROSO, or VIGOROSAMENTE. Boldly, vigorously.

VISTAMENTE, or VITE. With quickness.

VIVACE, VIVAMENTE, or CON VIVATICA. With briskness and animation.

VIVACISSIMO. With extreme vivacity.

VIVATICA. Vivacity.

VIVO, or CON VIVEZZA. Animated, lively.
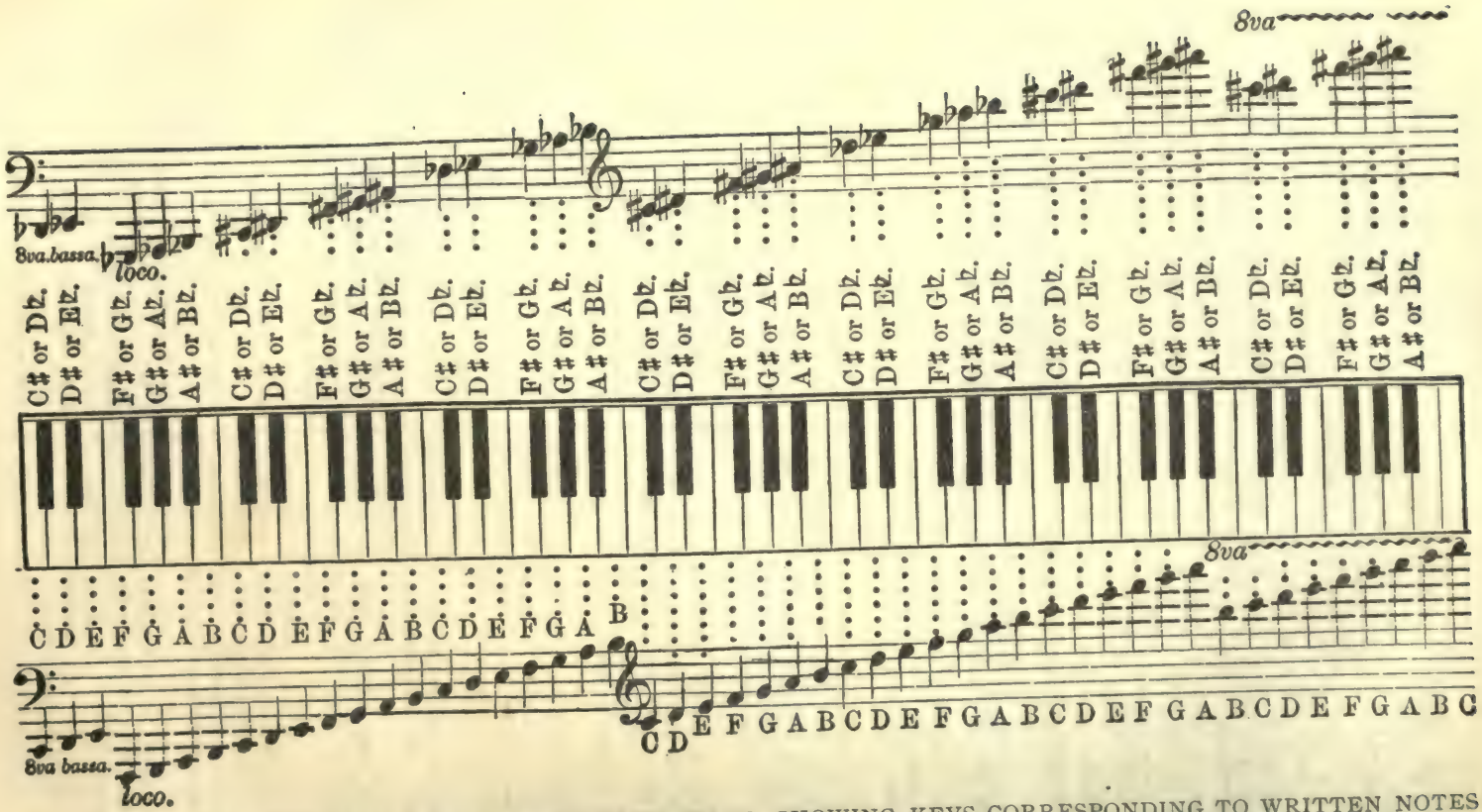
VOCE. The voice.

VOLTA. Time of playing a movement; as, *Prim. volta,* the first time of playing, etc.

VOLTI SUBITO, or V. S. Turn over quickly.

VOLVANTE. In a light and rapid manner.

WALZER. A waltz.



LAYOUT OF THE KEYBOARD OF A SEVEN-OCTAVE PIANO, SHOWING KEYS CORRESPONDING TO WRITTEN NOTES

THE PIANO SELF-TAUGHT

IN beginning the study of the piano, the student has the advantage of an instrument in which every tone is to be produced by a distinct and separate key, and is not obliged, therefore, to master the difficult science of producing different tones by shortening or lengthening a string. The keys are arranged on a board convenient to the player sitting in front of the instrument, and any desired tone within the usual compass of seven octaves, or about fifty natural tones, may be produced at will by simply pressing the proper key.

PRACTICAL INSTRUCTIONS FOR THE PIANO STUDENT

THE KEYBOARD.—As is familiar to every one, the keyboard of the piano or organ is composed of a row, or series, of white and black keys. The white keys sound the natural notes in every case, and the black keys, the *sharps* and *flats*. While the white keys follow one another in unbroken succession, the black keys are arranged in alternative groups of two and three, each such group being separated from that next following by two white keys having no black one between.

TONE-VALUES OF THE KEYS.—The names of the keys and tones to which they correspond may be readily understood by the accompanying table of the piano keyboard. In this diagram, as will be seen, the treble clef begins at middle C, which is the fourth C counting from bass end of the keyboard. It corresponds to a tone in the octave represented by the conversational pitch of the usual male voice; the C next below being the low tone for the male voice, and the C next above being about the correct pitch for the average female singer.

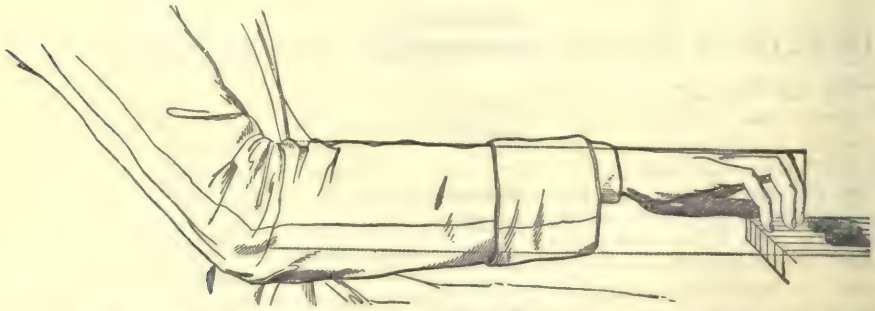
ON THE INTERVALS.—The distance between each key and the one next to it is one semitone. Thus, the distance between two white keys having a black one between is one whole tone, while the distance between two white keys without a black key is only a semitone. Therefore, since each black note represents the *sharp* of the key below or the *flat* of the key above, it follows that when two white keys come together, without a black one between them, the one above is the *sharp* of the one below, and that, in turn, is the *flat* of the former. Thus, B♯ is C♮; E♯ is F♮; F♭ is E♮. Each octave, therefore, contains seven keys representing naturals; five whole tones and two semitones, in addition to the five accidentals represented by the black keys.

POSITION IN PLAYING.—In playing the piano, the performer sits directly before the centre of the keyboard, in order to be able to reach all the keys easily; the piano stool being raised to a height sufficient to enable the arms to hang from the shoulders in a light and easy manner without straining or cramping its movements, while bringing the joint of the elbow to the level of the keyboard. The object of having the arm at this particular level is to secure, as nearly as possible, the best effect and the most artistic touch, which can result only when the muscles of the wrist and fingers work easily and without constraint.

PRINCIPLES OF TOUCH.—In beginning the study of the piano, the first difficulty encountered in developing a really finished touch will be found to lie in the fact that the fingers, each of which should properly press its key with perfectly even force and effect, so differ in strength among themselves that this result is by no means easy to attain. The thumb is usually the strongest, after which come the first and second fingers, then the little finger, leaving the third the weakest of all. Added to this fact, we find that the third finger does not move so readily as the first, second, and fourth, nor as the thumb. It will move very readily when the second finger is moved at the same time, but by itself its efforts are weak and ineffective. On account of this, very

many beginners on the piano develop the bad habit of using the first, second, and fourth fingers and the thumb, in most of their playing, and of giving the third finger as little to do as possible. If this habit is persisted in, the performance will always be indifferent, since, with that finger imperfectly developed, the artistic production of difficult compositions will be largely impossible. From another point of view also it is essential that all the fingers of each hand be developed as evenly as possible, since in properly shading and accenting music the pianist must know exactly what degree of force is required in every case.

EXERCISES FOR THE FINGERS.—The best possible exercise for strengthening the fingers, and later developing a good touch, is playing the scales constantly and persistently. Such a practice not only strengthens the fingers by compelling each one to act with equal strength, giving forth even tones, but also increases their individual activity, so that the tones may follow one another readily. For the attainment of the latter end, it is particularly desirable that the easiest exercises be practiced, carefully observing the correct fingering, as indicated in the printed notes. The fingering indicated in piano instruction books is calculated with great care, to the end of enabling the student to develop readiness and rapidity of touch. It is, therefore, in every sense, desirable that directions should be implicitly followed at the start, leaving all exercise of judgment in these matters for a period when practice has made expert. The same observations apply equally to the study of any other musical instrument: perfect tone production in playing the scales ensures the exercise and experience necessary for performing any kind of composition.



POSITION OF HAND AND ARM AT THE KEYBOARD

ELEMENTS OF GOOD PERFORMANCE.—To sum up the essentials of a correct touch on the piano, we may specify the following three heads:

(1.) EQUALITY OF STRENGTH.—Every note should be precisely like every other in point of the strength with which it is struck, and the loudness of the tone produced.

(2.) EQUALITY IN TIME.—Each note must follow that preceding it in precisely the same degree of movement; every note of equal value being held down for precisely the same period, as indicated by the metronome or timed counting; every note of larger or smaller value being given proportionately. In practicing the scales, all notes are equal in time, whether the movement be fast or slow, and it should be the constant aim of the student to make their duration exactly even in every case.

(3.) EQUALITY IN HOLDING DOWN NOTES.—Every key should be held down exactly the same period in playing the scales, and for this reason the student should carefully cultivate the habit of counting correctly the value of every note. Each finger should keep its key pressed down until the following key is struck, raising it at precisely the moment that the next finger touches its key. This rule must also be observed in passing the thumb under the fingers, or in passing the fingers over the thumb, in moving the hand up or down, into a new position.

It is positively essential that these rules be carefully observed, in order to develop the ability to play evenly and with good effect. All scales and finger exercises are, therefore, to be practiced very slowly at the start, and with most precise attention to the smallest details of time and touch.

ON CORRECT TONE-PRODUCTION.—In order

to secure facility in producing good tones on the piano, it is necessary to bear in mind that the interior mechanism is such that musical sounds result only when the following conditions are complied with:

(1.) Each key must be struck straight downward and exactly in the middle; never sidewise.

(2.) After striking, the key must be so firmly pressed down as to render the full tone of the instrument audible.

(3.) Although the finger must be raised before striking the key, in any case, it is desirable to avoid raising it so high that the blow on the key will be heard, in addition to the tone produced by the string.

(4.) The arm and hand should never make a jumping movement, even when striking a key with considerable force since the fingers can not produce pleasant and tranquil tones with an unsteady hand and arm.

All these rules should be observed as strictly in runs, skips, extensions, etc., as in slow and quiet passages.

PRINCIPLES OF FINGERING.—In the matter of developing correct fingering on the piano the following rules must be carefully observed:

(1.) The fingering must always be calculated so as to preserve the natural position of both hands on the keyboard. The natural position of the hand is found when the thumb and four fingers rest evenly and lightly on five consecutive keys; the right hand having the thumb on the lowest note and the little finger on the highest, and the left hand, of course, in the reverse order.

(2.) In all *major* keys with flats, the thumb of the right hand is used only on the *first* (*do*) and the *fourth* (*fa*). This rule has very few exceptions.

(3.) The thumb and little finger should be used on the black keys only when there are so many of them indicated in the printed music that correct execution requires it. Even in this case it should be avoided as often as possible.

(4.) Repeated notes should always be played with different fingers.

(5.) The fingering of *arpeggios* must always be the same as would give the chord indicated, when all the notes are to be struck simultaneously.

(6.) A finger may be slipped from a black key to the following white one in quick and *legato* passages; but, when the movement is slow, another finger should play the following note.
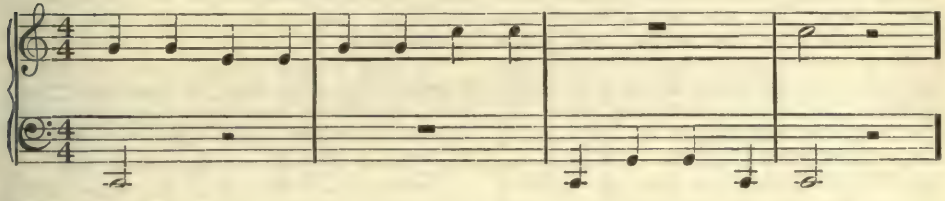
(7.) In playing octaves the little fingers should not be placed upon the black keys, except where necessary.

(8.) In playing chords of three notes the fingering should be so calculated as to leave the unemployed fingers over the longest interval.
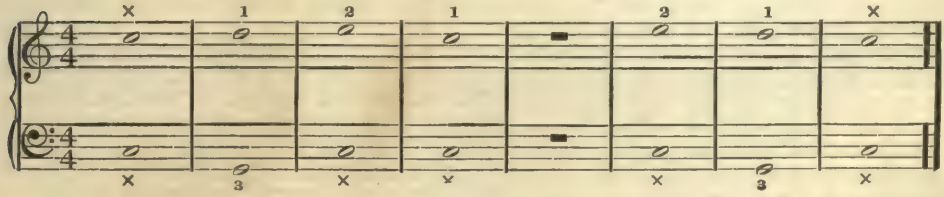
(9.) In chords of four notes the unemployed finger should be over the interval of the fourth, unless that interval be made with the thumb, in which case the unemployed finger should be over the shortest interval.

(10.) Doubts as to the proper method of

EXERCISE IN NOTES AND RESTS



WHOLE NOTES AND RESTS, COMMON TIME



fingering a given piece correctly may always be settled by referring to the indicated fingering of the diatonic scale of the key in which the piece is written.

(11.) The diatonic scales are all fingered upon the same principles. Since the thumb and the first and second fingers are used twice on the treble scale, this is fingered, so that the third finger is used only once in every octave. This fingering is based upon the scientific fact that if the third finger is placed upon its proper key, the others will take their correct places. For this reason, as shown in the accompanying notes, the third finger is used only in the second position in each octave. In the scales for the *bass* clef the fingering is generally marked, so as to give the first note with the thumb or third finger; the second with the second finger; the third with the first, and the fourth with the thumb; making the second position of the octave with the third, second, first, and thumb. According to this scheme, the third finger may be used in both positions, although many instructors recommend that the student begin the scale with the thumb.

FINGERING THE SCALES.—The following excellent rules for fingering the scales are given in a well-known book of instruction for piano students:

"THE DIATONIC SCALES are all fingered upon the same principles. As the thumb, first and second, or second, first and thumb, are always used twice, and the third finger once, in each octave, it follows that if the third finger is placed upon its proper key, the other fingers will readily take their proper place.
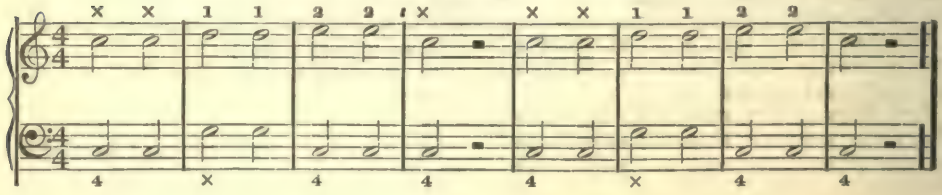
"IN THE MAJOR SCALES, place the third finger of the right hand, in Scale of C, on B; G on F♯; D on C♯; A on G♯; E on D♯; B on A♯; F♯ on A♯; C♯ on A♯; A♭ on B♭; E♭ on B♭; B♭ on B♭; F on B♭.

"Left hand.—Third finger in Scale of C on D; G on A; D on E; A on B; E on F♯; B on F♯; F♯ on F♯; C♯ on F♯; A♭ on D♭; E♭ on A♭; B♭ on E♭; F on G.
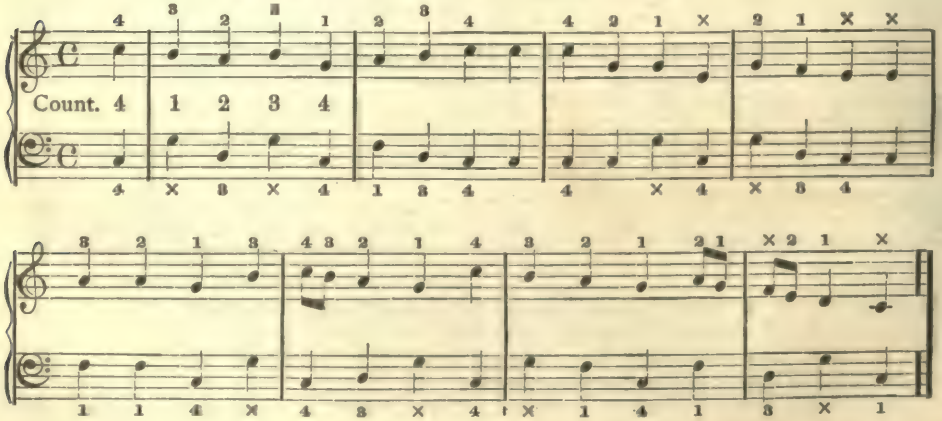
"The Scales of C, G, D, A, and E are fingered with the third finger of the right hand on VII; and the third finger of the left upon II of the scale.

"The Scales of B, F♯, and C♯ employ only two white keys in each octave—which are played with the thumb. The black keys are played with 1—2: 2—1: or, 1—2—3: 3—2—1.
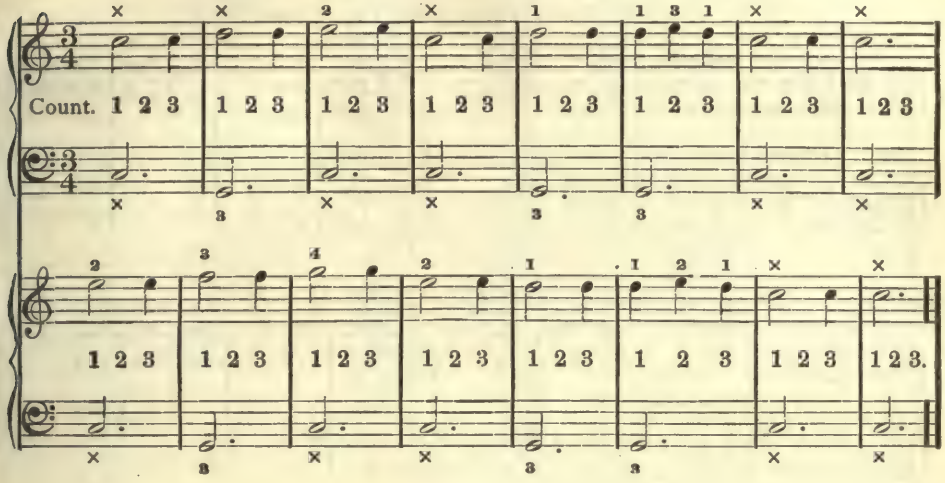
HALF NOTES AND RESTS, COMMON TIME
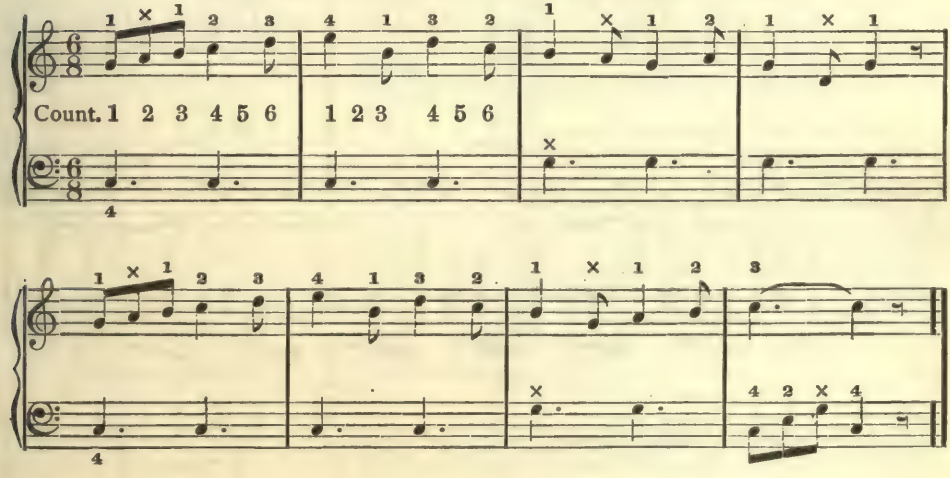


QUARTER NOTES, COMMON TIME



DOTTED HALF NOTES, THREE-QUARTER TIME



DOTTED QUARTER NOTES, SIX-EIGHTH TIME



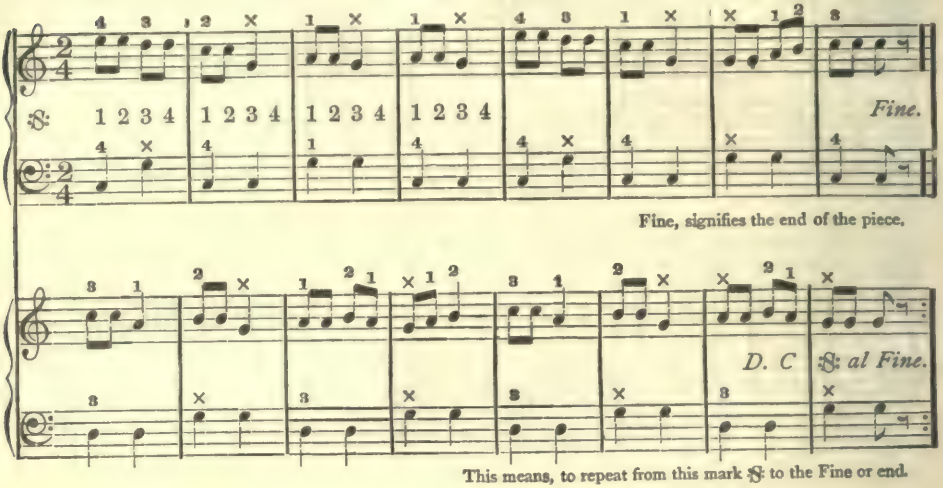
Most of the Flat keys have a similar fingering, viz. — the THIRD finger of the right hand always falls on B♭ in the keys of F, B♭, E♭, A♭, D♭, and G♭. In the left hand, the THIRD finger will fall on IV of the scale in the keys of B♭, E♭, A♭, and D♭.

"IN THE MINOR SCALES place the third finger of the right hand in Scale of C on B; G on F♯; D on C♯; A on G♯; E on D♯; B on A♯; F♯ on D; C♯ on A; F on B♭; B♭ on B♭; E♭ on B♭; A♭ on B♭.

"Left hand.—Third finger in Scale of C on D; G on A; D on E; A on B; E on F♯; B on F♯; F♯ on F♯; C♯ on F♯; F on G; B♭ on G♭; E♭ on G♭; A♭ on G."

IMPORTANCE OF THE SCALES.—Since the practice of the scales is nearly the most important element in obtaining a correct understanding of the piano, it may be said truly enough that the student need study little else until he has thoroughly mastered them. If he has been perfectly attentive and conscientious, he will then be able to play with perfect equality of force and time, and with such a thorough understanding of fingering that he will be able to perform other pieces without the delays caused by interference and uncertainty in this respect. It is desirable, if not necessary, to impress upon the student's mind that, in the work

PIECE IN TWO-FOURTH TIME
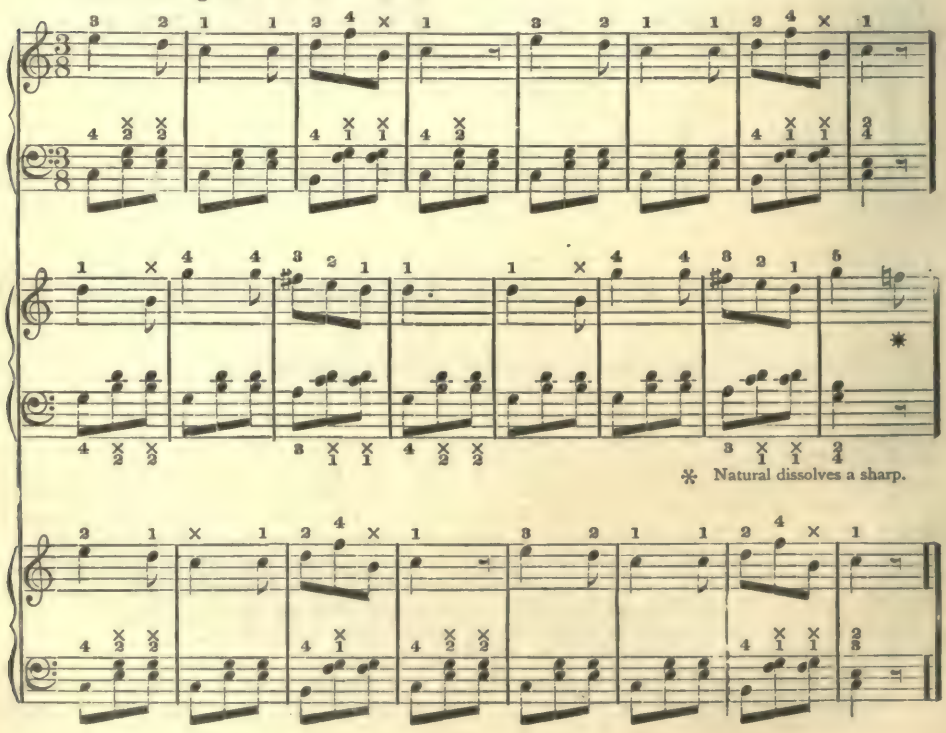


Fine, signifies the end of the piece.

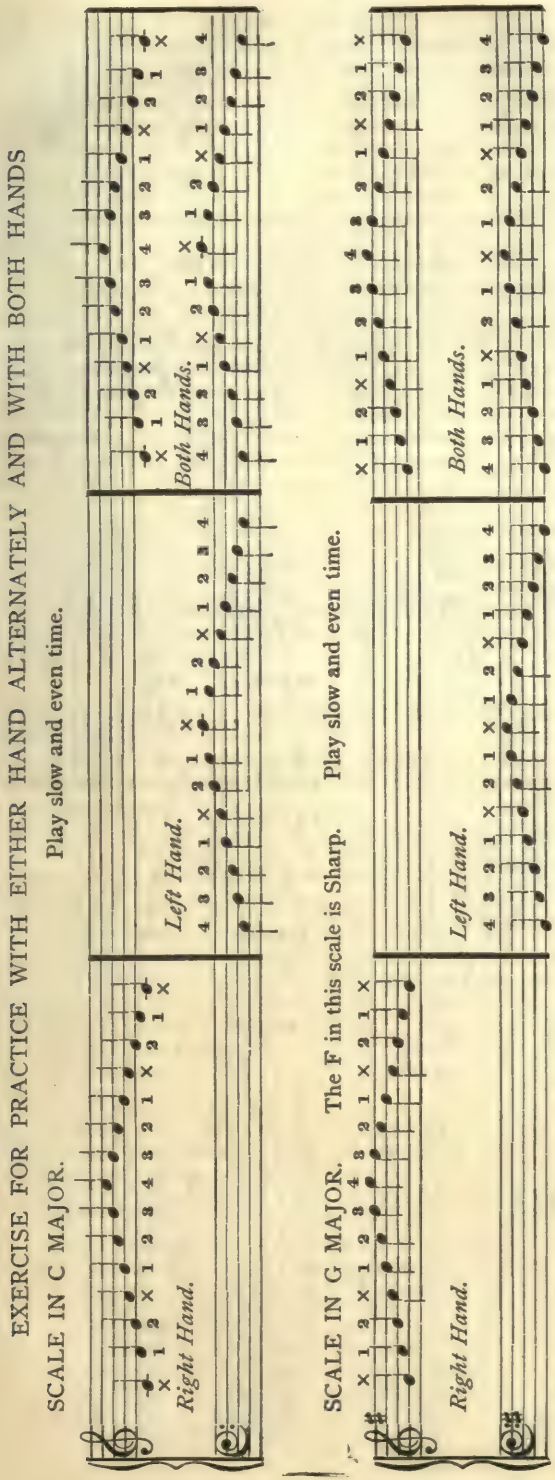
This means, to repeat from this mark 𝄋 to the Fine or end.

PIECE IN THREE-EIGHTH TIME, INCIDENTAL SHARP

Count three eighths in each measure.



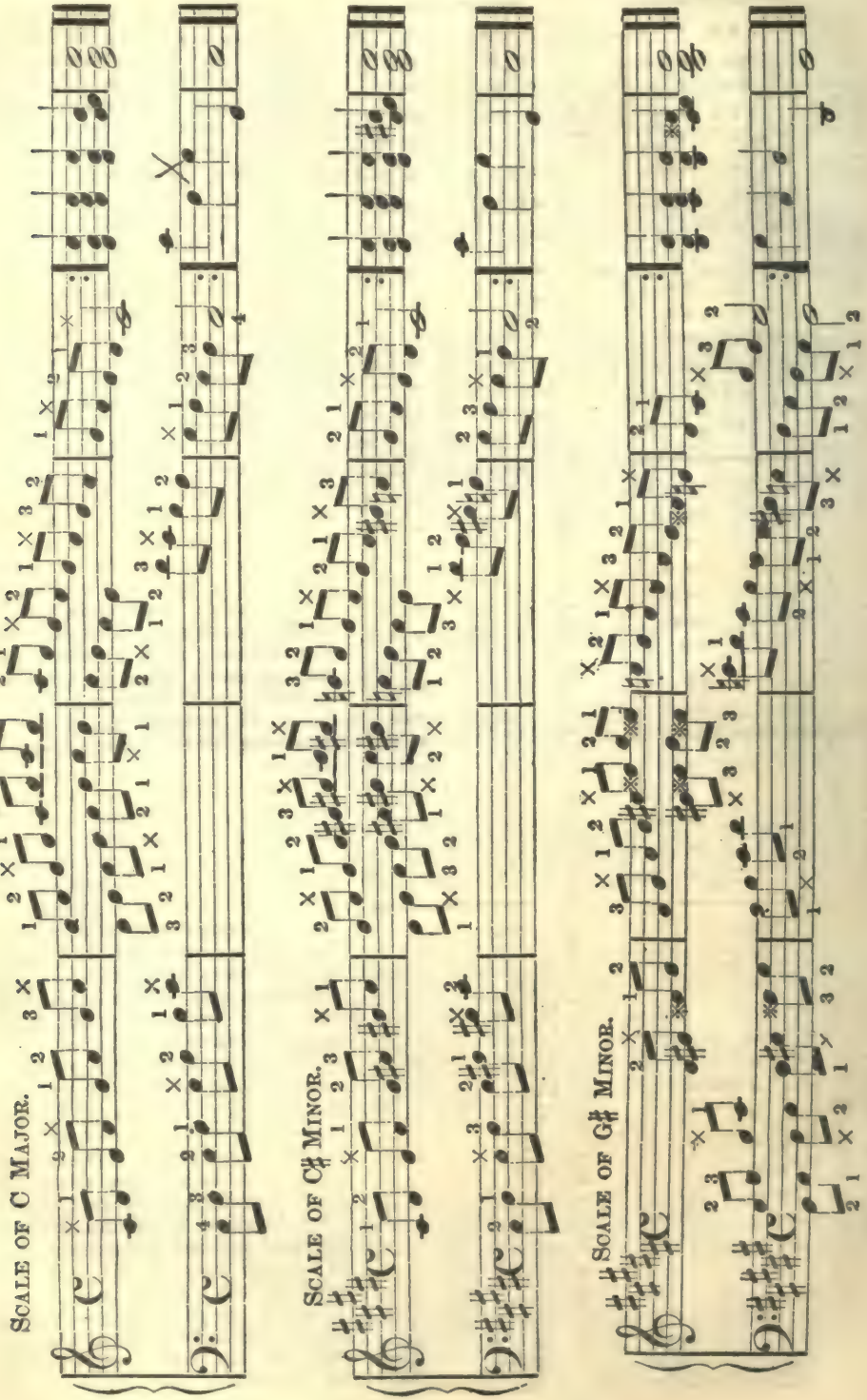
✻ Natural dissolves a sharp.



of practicing, he should always play by note, avoiding the habit of playing from ear or memory. It is often desirable to be able to play without notes, or to learn a melody easily on hearing it a few times. But it is even more important that the student, by constant attention to the written notes, should cultivate the ability to read rapidly and correctly. This is nearly the best method of learning to read at sight in any musical instrument.

Rules for Practicing.—In practicing, the student must be particularly careful to avoid forming habits of moving the head, body, or arms in any way other than is actually necessary. To be sure, in striking high notes in the treble and low notes in the bass, it is necessary to incline the body to one side or to the other, but nearly all other movements, which are too frequently seen among otherwise good players, are to be avoided, as far as possible. Among such undesirable movements are inclining the body forward, as if a difficult passage of music could be simplified on being viewed closer at hand; the habits of nodding the head or drumming with the feet, in keeping time. It is, also, essential to the best quality of touch—consequently, also, to the best tone-production—that the fingers be as even and well regulated as possible. The student should avoid forming the habits of lifting the fingers too high; of straightening them on raising from a key, or of moving the arm or wrist, in the effort to produce emphasis. While it is difficult for a beginner on the piano to develop more than the rudiments of a good touch, it is desirable that he understand, at the start, that the greater majority of emphatic passages and strong accents may be rendered by simply varying the force used in pressing down the key. The method of varying the force, however, to suit the requirements of finished performance, can be learned only as the result of extended and earnest practice.

Faults to be Avoided.—Among other faults to be avoided from the start are the habits of rendering the *retardando* too slowly or the


Scale of C Major.
Scale of C♯ Minor.
Scale of G♯ Minor.

accellerando too rapidly. The notion that these signs demand such a radical change in movement, as to affect the time in which the piece is written, involves that the best effect of the playing is lost.

Use of the Pedals.—In connection with the faults just mentioned it is desirable to further warn the student against incorrect use of the pedals. Although the proper places for using the pedals are usually marked in compositions for the piano, the finished performer will frequently use them at other points, according to his own theory of interpreting the music. However, until the student is thoroughly acquainted with the use and effect of the pedals, and has also developed by practice the comprehension of the proper points at which to use the left one, for damping the vibrations, or the right, for lifting the damper from the strings, thus diminishing or increasing the quality of the sound, he had best avoid using them, except as indicated in written music.

Rules for Finger Movements.—When executing scales and runs, the easiest movements are as follows:

(1.) Bend the hand slightly upward, although avoiding all marked and ungraceful attitudes.

(2.) Hold the arm slightly away from the body, keeping it steady, without twisting or turning, while it follows the movement of the hand, up or down the keyboard.

(3.) In passing the thumb under the fingers, move it under each finger consecutively, as that finger strikes its key. In learning this movement, particular attention must be given to the thumb in practicing.

(4.) Avoid the tendency of the first finger to remain on its key, after striking. This is a common fault in playing scales.

(5.) In order to learn the passing-under of the thumbs, carefully practice each hand's part separately.

Finger and Wrist Action.—In effective playing, three distinct actions are recognized: (1) simple finger action with the wrist held firmly; (2) wrist action downward; (3) wrist action upward.

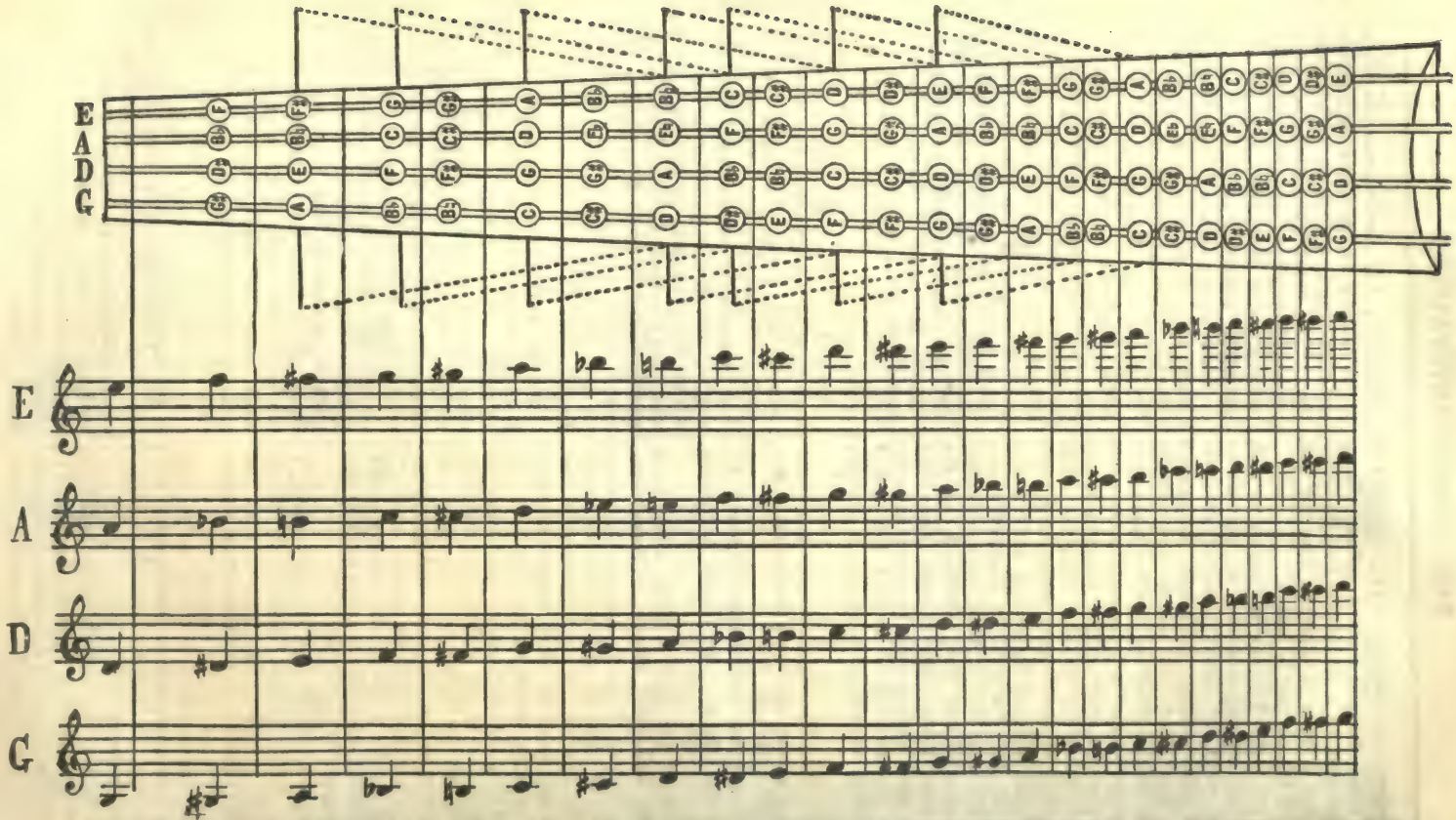
Simple finger action is used in playing any series of connected or legato notes, except, perhaps, in playing runs of *thirds, sixths* and *octaves.*

Wrist action downward, with apparent raising of the hand, is used in playing (1) repeated notes; (2) the first note of a group or phrase; (3) chords; (4) octaves in ordinary use; (5) demi-legato notes, with as little raising of the hand as possible; (6) staccato notes, with a somewhat freer raising of the hand; (7) double staccato notes, or staccato played rapidly, except when a *dot* or *point* indicates the last note of a group or phrase.

Wrist action upward is used principally in playing notes followed by a rest, and staccato notes to be rendered slowly.

On Playing Octaves.—In playing octaves, the student should be particularly careful to shape his practice, with a view to developing easy and graceful movements that do not disturb the normal rhythm of playing. Facility in playing octaves depends on the proper use of the wrist. The hand should be raised at the wrist before striking, and, then, with an easy movement, thrown down, as it were, upon the keyboard. As soon as the required notes have been struck, the hand must be again raised at the wrist, in readiness to strike the next octave, if there is one; or to resume its normal position, in readiness to strike the next succession of notes. In playing octaves, the student should lift his hand at the wrist, but he must not understand that this lifting is to be at a large angle, or any further above the keys than is necessary to enable the hand to move backward or forward to the indicated position for making the octave. Briefly expressed, he is required only to lift his fingers from contact with the keys.

Familiarity with Keys.—One point that it is particularly desirable to keep carefully in mind, while practicing, is developing an easy familiarity with every key—which is to say, every scale or octave written in particular keys, as already explained in the section on the rudiments of music. Although the effect of sharps or flats at the signature may seem an uncertain and complicated matter to the beginner, it is a thing which must be carefully studied, at the start, and when once mastered, as it must soon be, will remove very many causes of perplexity in his subsequent studies. As a matter of fact, it is no more difficult to play a piece having a number of sharps and flats than to play in the simple key of C. The black keys are narrow, and, hence, somewhat more difficult to press down firmly and fully, but if the student will once accustom himself to reading the signature correctly, understandingly, and rapidly, one serious difficulty will be overcome for him.



LAYOUT OF THE KEYBOARD OF A VIOLIN, SHOWING TOUCHES CORRESPONDING TO WRITTEN NOTES

THE VIOLIN SELF-TAUGHT

THE most familiar of the stringed instruments is the violin, whose shape, construction, and manner of playing are familiar to all. Briefly described, it consists of a peculiarly shaped box, called the *body,* at one end of which is attached the *neck.* The two sides of the box, or *body,* are called, respectively, the *belly* and the *back;* both being carefully shaped, or arched, in order to afford the greatest possible resonance. On either side of the belly are the *sound holes,* which, from their shape, are frequently called the *f*-holes. The belly and back are joined together by a number of narrow side pieces called *ribs.* Within the body of the instrument, between the *sound holes,* is a small upright piece, known as the *sound post,* one end of which rests on the *bass bar* glued to the under side of the *belly,* and the other, against the inner side of the back. These two pieces serve to strengthen the instrument by offering resistance to the tension of the stretched strings. The *sound post* also conveys the vibration from the *belly* directly to the *back* board.

The *neck* of the instrument carries at one end the so-called *peg-box,* in which turn the four *pegs,* carrying one end of each of the strings. The opposite ends of the strings are attached to the *tail-piece,* which is hung to the opposite end of the body. Extending over the neck, from the upper end of the body, is the *finger-board,* which is separated from the *peg-box* by a low narrow ridge of hard wood called the *nut.* This nut serves to raise the strings somewhat above the level of the *finger-board,* in order that their vibrations may not be interfered with. Across the belly of the instrument, between the sound holes, is set another narrow strip of hard wood, called the *bridge.* The strings, extending from the tail-piece to the peg-box, pass over the *bridge;* each one being free to vibrate in its entire length from that point to the *nut.* Each string is tuned by stretching it to a sufficient tension by twisting the *peg* to which it is attached.

PRACTICAL INSTRUCTIONS FOR THE VIOLIN STUDENT

THE strings are of four sizes, or diameters, the first or highest, placed on the right side, as one looks toward the belly of the instrument, being of the smallest diameter; the fourth, or lowest, at the left of the instrument, being the largest in diameter. The strings are made of catgut, usually formed of the membranes from the intestines of sheep. The largest string is covered with spirally wound silver wire, which serves to deepen the quality of its note.

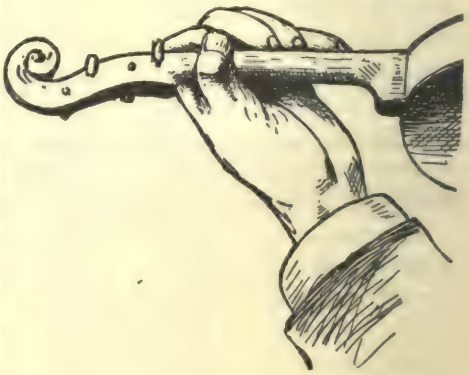
THE BOW.—Although, as constructed, the violin may be played like the guitar or man-

dolin, by picking the strings with the fingers or with a special quill or *plectrum*, its characteristic music is evoked by the use of an instrument known as the *bow*. This consists of a stick of hard, close-grained wood, having a projection at one end called the head. At the opposite end is a slot in which slides the nut; a thumbscrew at the end of the stick moving the nut backward or forward as desired. Between the head of the stick and the nut is hung the hair, which may be stretched to the required tension by turning the thumbscrew and sliding the nut toward the end of the stick. When covered with a small quantity of resin, the bow, sliding on the strings, is able to produce the characteristic sounds of the violin music. Indeed, the whole secret of playing the violin properly, and producing pleasing sounds, rather than disturbing scrapes and wheezes, lies in the proper manipulation of the bow. Skill in this particular comes, not only from practice, but also from correct instruction at the start; being in fact precisely what a good touch is in piano-playing and correct breathing in the production of vocal music.

THE TONES AND TOUCHES.—The four strings of the violin are tuned to perfect *fifths*, beginning with the tone corresponding to G next below *middle* C on the piano for the fourth or lowest string. The next three strings, accordingly, are; for the third string, the D above *middle* C; for the second string the A next above, and for the first string the following E. As is well known, the intermediate tones between the so-called open tones of each string are produced by pressure of the fingers at certain definite points in the length of the string. Although the violin has no frets or touches, like the mandolin, guitar, etc., the point on the finger-board at which pressure will produce the several tones and semitones are situated precisely as in these instruments. Thus, on the G string, the G♯ is situated at a point approximately about 7-8 inch from the nut; the A about 1-2 inch; the B♭ at about 2 3-16 inch; the B at 2 5-8 inch; the C at 3 1-4 inch. The next string above, giving D as its open tone, has the D♯, the E, the F, the F♯, and the G at the same respective distances from the nut. Similarly also, the second, or A, string has the B♭, B, C, C♯, D, and E♭; while the first, or E, string measures off the F, F♯, G, G♯, A, B♭, and B.

Although the notes represented by successive open strings may be produced by carrying the pressure of the fingers sufficiently far down in its length—the intervals between the touches becoming constantly smaller as we approach the end of the finger-board furthest from the peg box—altogether the best practice is to play each fifth note on the open strings in order to avoid too much shifting of the hand up and down the neck, and consequently also corresponding delay and irregularity in rendering the music. It is frequently customary, however, to give the notes higher than the compass of the first position by running up the string, thus obtaining an available playing compass of at least one-half octave above the open tone.

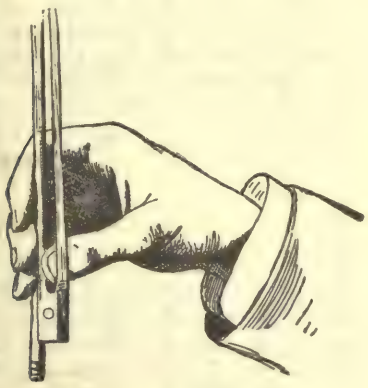
HOLDING THE VIOLIN.—The methods of holding the bow and the violin are indicated in the accompanying illustrations. It is necessary to add only that the instrument should be so held as to be at right angles to the body, on a line exactly parallel to the position of the left foot, upon which the



weight of the body should be thrown in standing. The body of the instrument should be held firmly between the chin and the left collar-bone; the left hand maintaining it at such a slant that the bottom of the scroll on the end of the neck is on a level with that part of the body pressed by the chin.

HOLDING THE BOW.—The bow should be held with the right hand, the thumb being against the lower side of the stick, close to the slide or nut; being balanced at the top by the first and fourth fingers, as already explained. The second and third fingers rest only gently upon the stick, serving to steady it between the varying pressures of the other two fingers. Thus, the pressure on the strings is varied according to position by the first and fourth fingers, as already indicated. The movement, up or down, is

controlled, as far as possible, by motions of the hand and wrist, and, when the limit of these has been reached, by motions of the forearm, working from the elbow; the upper arm being held close against the body, until the movement of the bow, coming nearer to the nut, requires that it move slightly forward, while keeping as near the body as possible. Since the first and fourth fingers of the right hand perform the



most important function in regulating the pressure of the bow, hence in obtaining the best effects of bowing constant effort should be exercised to guide their actions so carefully as to equalize the pressures of all strokes, short or long, in either direction.

In Fingering, or Stopping, the strings the four fingers of the left hand are used, the joint being bent double in each case, so as to bring only the tips of the fingers against the string. In the act of stopping the strings, the fingers must be brought down with strength and firmness; greater force being necessary on the larger strings. In learning fingering it is necessary to practice persistently, in order to secure a pure tone at every stop and to accustom the fingers, by constant exercise, to press the strings with proper force and effect. The fourth finger requires particular exercise, because its pressure on the strings is the weakest, and also because, at the beginning of practice, it will be found difficult to move it freely, independent of the third finger.

In fingering the notes on the violin it is desirable to hold the fingers against the strings as long as possible, not making short and sharp contacts like the hammers of a piano. In playing ascending scales, therefore, the fingers are brought down, one after another, and held firmly against the strings, while, in playing descending scales, they are raised, one after another, each successive tone being ready made as required.

Practical Points on Playing.—As is evident from the diagram of the strings and keyboard already shown, the tones of the open strings D, E, and A may also be made with the fourth finger on the string next above. Whether one plays on the open string, or produces the tone on the string below, is largely determined by the particular piece he is playing. As a rule, however, it is considered best to keep on one string as long as possible. Thus, unless in playing long upward runs, when it is desirable to give the open tone on the succeeding string, so as to allow the hand sufficient time to shift its position, it is generally customary to make the D, A, or E on the string above. One more rule usually followed, on account of superior convenience to the player, is that when a succession of notes is to be played in one movement of the bow, it is preferable to make the note by the pressure of the little finger, if the following tones are lower. When, however, the run or succession is upward, the open string is used.

Principles of Bowing.—The most essential point in correctly playing the violin is good bowing. This involves, not only a light and careful touch on the string and the ability to produce loud or soft notes as desired, but also exact knowledge of the proper movements in executing different musical effects. Careful study and observation soon reveal the fact that there is a very great difference between the up-stroke and down-stroke of the bow, and, also, that the tones produced vary greatly in effect, as they are produced by short, sharp strokes, up and down, or in the course of a long sweep of the bow.

The Strokes.—The first rule for good bowing is based upon the observed fact that the up-stroke, from the head to the nut, is necessarily weaker than the down-stroke, in the opposite direction. This follows from the pressure naturally brought to bear by the hand in making each of these movements. In order, therefore, to equalize the force of contact as much as possible, it is desirable to use pressure with the first and little fingers of the right hand. The further down the bow is moved, the stronger the pressure to be made with the first finger; the further upward it is moved, the stronger the pressure to be made with the little finger.

On Contact.—In making contact between

the bow and the strings it is necessary that the hair rest firmly upon the string, about one-half inch above the bridge. The stick of the bow is slightly inclined toward the finger-board, thus giving a firmer grip on the string, and also enabling the performer to vary the tones as desired.

Moving the Bow.—In moving the bow in either direction, from the head or from the nut, it is necessary to describe a perfectly straight line, always running parallel to the bridge. In order to accomplish this, a gradual movement is given to the wrist as the stroke progresses. Thus, when the contact of the bow is nearer the nut, the wrist is bent somewhat upward; sinking gradually as the stroke approaches the head of the bow, with the result of elevating the hand. The movements of the wrist and hand are thus of importance in bowing, although it is not correct to move the arm above the elbow, except so far as it necessarily yields to the movements of the forearm. Thus, on beginning the up-stroke, with the head of the bow nearest to the point of contact with the string, the upper arm and elbow are held flat against the body, and all movements are made with the forearm, until nearly one-half of the stroke is completed. Then, bringing the bow nearer to the nut, the upper arm is necessarily lifted, in obedience to the movements of the forearm.

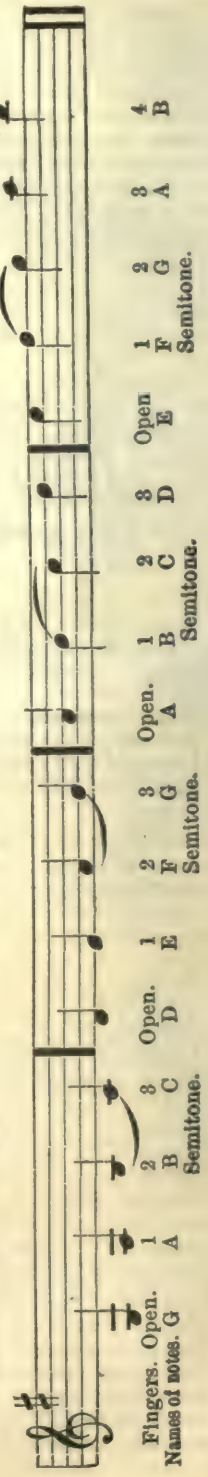
It is necessary that these rules, in regard to the use of the forearm only in working the bow, be carefully observed. If the upper arm is allowed to originate the impulse that moves the bow, in other words, if the whole arm is used, it will be found difficult to maintain the bow in a straight line parallel to the bridge, thus making a full pure tone impossible.

Speed in Bowing.—Another very essential point in bowing is to acquire the ability to make all strokes, upward or downward, at the same speed. Since, as frequently happens, there are runs of considerable length in violin music, it is desirable that as many notes as possible be produced in one stroke of the bow, in order that, in as few cases as possible, it will be necessary to change the direction of the bow in making such runs. Of course, since the location and length of the notes, except the open tones, are determined by the pressure of the fingers, as already explained, the movement of the bow may be slow or rapid with the same quality of tone production. It is desirable, therefore, to adopt a rate of bowing that may be steadily maintained without

ASCENDING SCALE FOR THE VIOLIN OR MANDOLIN

The names of the notes and the proper fingering are indicated in this staff, which may be readily performed by reference to the diagram of the fingerboard already given

SCALE IN THE FIRST POSITION
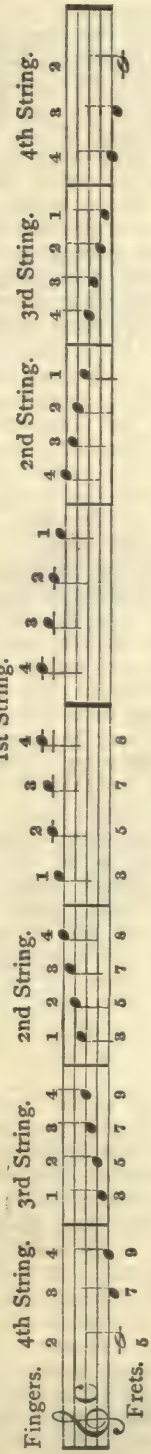


wearying the arm, or without hurrying the time of the longer notes and runs. The habit of beginning with rapid strokes has the very bad effect of producing jerky notes, strong in quality at the beginning of the stroke, and growing weaker toward the end.

DIFFERENT QUALITIES OF TONE.—Although the time-values of the tones are not effected by the bowing, except in *staccato* movements, which are produced by short sharp strokes, all shading and accenting are produced by properly handling the bow. In order to produce a louder note, it is not necessary to press more heavily upon the bow, thus making a scraping effect: the result may be far better attained by moving the bow nearer to the bridge, and, while drawing it with a firmer hand, allowing the stick to be only slightly inclined. Conversely, a soft tone is produced when the bow is moved further from the bridge and closer to the finger-board; the movement being performed with a lighter pressure of the hand. It is necessary, for the production of correct effects, that the rules regarding the degree of pressure to be used in every case should be carefully observed; since, in playing on either side of the usual line in which the stroke of the bow is made, decided variations of pitch and quality are liable to result. Thus, when playing close to the bridge with only a slight pressure on the bow, shrill tones will result. On the other hand, a very light touch nearer to the finger-board produces soft and flute-like tones, which are particularly effective in certain measures.
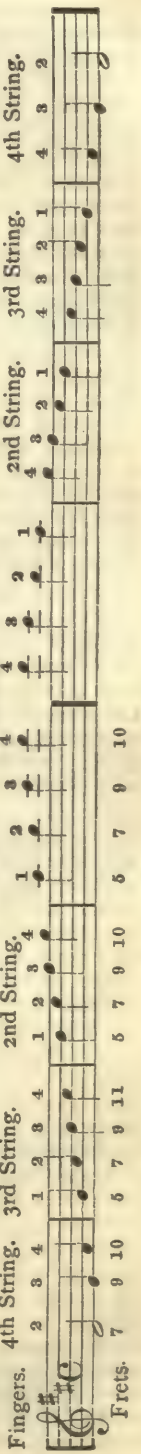
TRANSITION MOVEMENTS.—In increasing or diminishing the sound, as in *crescendo* and *decrescendo* movements, the varying effects required may be produced by skilful handling of the bow. Thus, for the *decrescendo*, the loudest and strongest tone is begun near the bridge with a firm pressure, as already described. As the tone decreases in loudness, the bow is moved further from the bridge, at the same time being more and more inclined toward the finger-board, with a constantly decreasing pressure of the hand. On reaching the limit of the movement with the softest tones, it will be found that the bow is so far inclined toward the finger-board that only a part of the hair is in contact with the string.

UP-STROKES AND DOWN-STROKES.—Another point of considerable importance, particularly at the beginning of study, illustrates the kind of stroke to be used for producing desired effects. Thus, the up-stroke is weaker than the down-stroke, with

SCALE IN THE SECOND POSITION



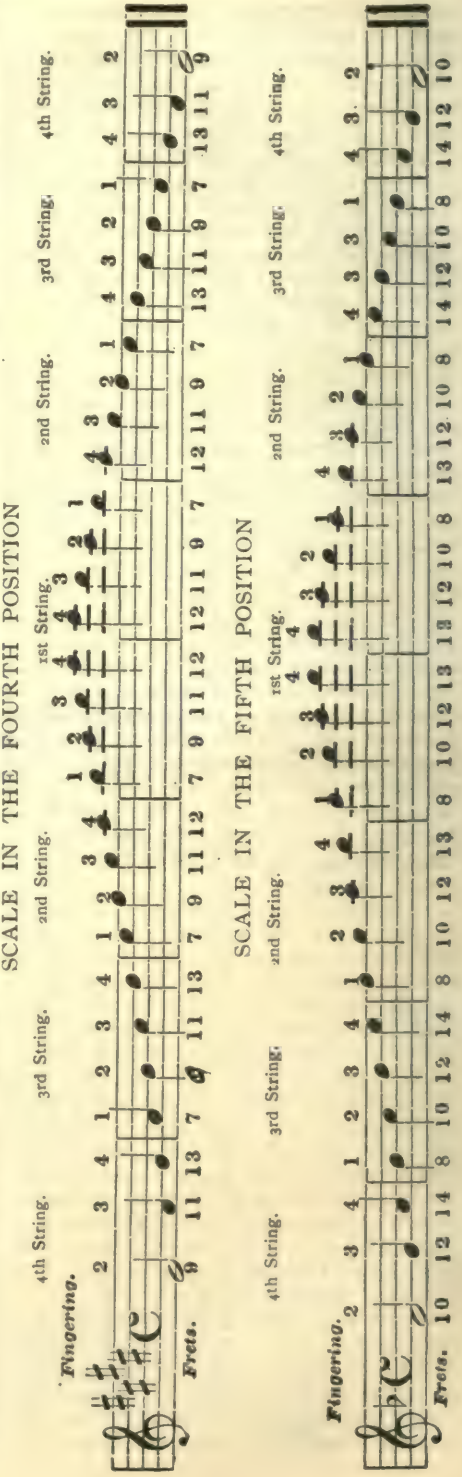
SCALE IN THE THIRD POSITION



all but the very best performers. It is customary, therefore, to tell the beginner that strongly accented passages should be played with a down-stroke, while the weaker beats are taken with an up-stroke. In actually rendering advanced passages for the violin, it is difficult to apply these rules with any degree of rigidity. Indeed, nearly the first thing that the student of the violin should seek to attain by practice is the development of equal strength in both upward and downward strokes. However, it is customary, particularly in orchestral work, to use the down-stroke on syncopated notes, on chords, on single tones that are to be gradually decreased in volume, and on all tones that are to be rendered particularly prominent: on all strong beats, also, the down-stroke is regularly employed. When it is desirable to give particular stress to notes occurring at close intervals, the down-stroke may often be made several times in succession, in order to produce the desired effect.

Signs for Strokes.—This succession of the proper strokes to be made in rendering various movements can not be finally and definitely settled by any general directions. In default of an experienced master to give him adequate instructions in this matter, the student must depend upon the written indications for bowing usually given with music intended for beginners. Thus, in very many cases we find the down-stroke indicated by a square U-shaped figure, while the up-stroke is indicated by this same figure inverted or by an acute angle resembling the letter V inverted. Other composers use a vertical line to indicate the up-stroke, and a slanting line to indicate the down-stroke; further indicating the points at which the stroke is to start, whether at the nut, middle, or head, provided it is to be a short stroke by short lines, drawn parallel to that indicating the direction.

By carefully observing all the rules already laid down for proper bowing, the student will very soon learn the most effective and convenient methods of producing any effects indicated in written music. The question of down-strokes and up-strokes relates largely to the ease of handling the bow on certain movements. If, however, the rule for equalizing the pressure throughout the stroke, by the use of the first and fourth fingers, is rigidly observed in all practice, it will be easier to render the desired effects with the bow at any part of a stroke. The *staccato* effects and transition movements, *crescendo*, etc., should be care-



fully practiced according to directions already given.

THE NOTES.—In producing a whole note on the violin the bow is drawn in either direction in which it happens to be travelling at the time, so as to form a *crescendo* movement, succeeded by a *decrescendo,* each for

BOWING OF WHOLE NOTES



one-half the time of the note. Thus, the greatest volume of sound occurs as nearly as possible at the middle of the measure.

Among other useful rules for manipulating the bow it may be stated that the best practice is always to begin a full measure with a down-stroke. In general, except in *staccato* movements and grace notes, the time and sequence of the tones are produced by fingering, the bow moving from end to end, upward or downward, with a slow or rapid motion, as is best suited to the time.

In playing *triplets* the best procedure is to use a greater length of bow for the first note of each three, giving it a light start, and then resuming equality of movement. This impulse, given to the first note, adds to the effect in passages requiring energy in performance.

In order to acquire the flexibility demanded in parts of detached or *staccato* passages, it is well to practice on the open strings, being particularly careful to make the motions as light and even as possible, thus avoiding jerking motions, pressing very moderately on the string, and obtaining as full a vibration as possible in each case.

In performing the movement known as *glissando,* or "gliding," the finger that has just stopped the string slides up to a new

GLISSANDO



The small notes remain unheard. Movement reversed.

position, still holding it down, and the next finger stops at the required touch. This is shown in an accompanying example.

POINTS FOR PRACTICE.—The matter of bowing is simple, and, in order to acquire the desired effect in producing fulness and purity of tone, it is necessary only to remember the rules already given for obtaining loud or soft tones, remembering that it is very seldom necessary to increase the pressure of the bow on the string, and that a light and gentle touch is all that is required in practically every passage that may be written. The student should, therefore, aim (1) to produce a full and correct tone by proper fingering, and (2) a good singing musical quality by moving the bow directly across the string, with the gentlest possible contact consistent with the production of sound.

TUNING THE STRINGS.—As the violin is tuned to perfect fifths—the respective open tones being G, D, A, E, from left to right, as previously stated—it is a comparatively simple matter to tune the strings. As it is also an act that is very frequently necessary, the student should thoroughly understand the process as early as possible in his studies.

The method most often followed by violinists is to tune the second string to the tone of A, found by using an A tuning-fork, or by getting the tone from the piano or other instrument. When this string is once perfectly tuned, the tone of the first, or E, string may be readily found by running the natural scale upward to the *fifth degree,* and tuning the first string to unison. The tuning may be verified by running the natural scale, so as to place the *fifth* on the first string.
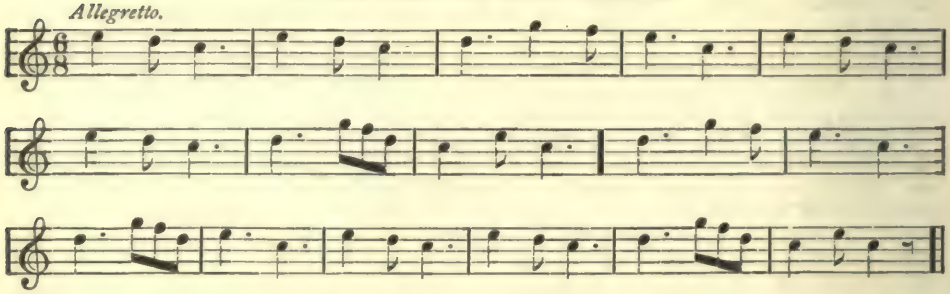
The third string may then be tuned to the fifth below, or D, being drawn up until the sound is judged to be correct and verified by running the scale up or down, so as to place the open tones on *fifths.* The same process is repeated in tuning the fourth, or

G, string. The correctness of the tuning may be proved, either by running the natural *major* scale from G to E, or by drawing the bow over each open tone, in succession, to identify the perfect *fifths,* which may soon be learned by ear.

If the beginner finds it easier to begin tuning with some other string—say the fourth, or G, string—he may obtain the perfect tone on that, and find the next higher tone on the *fifth,* whose touch is approximately 4¾ inches from the nut with every string. This method, however, is far less simple than that already outlined, and is never followed by experienced violinists.
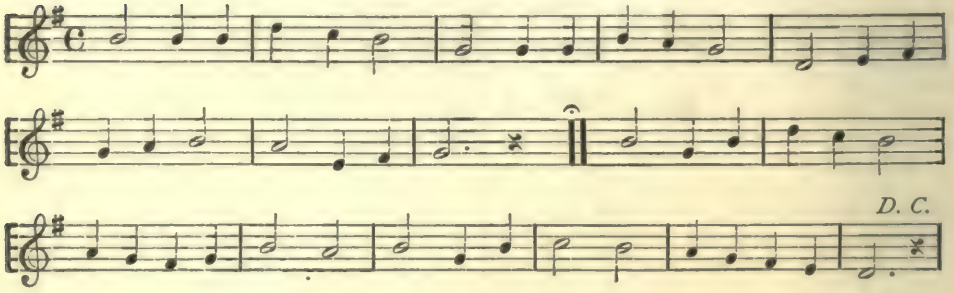
SIMPLE PRACTICE PIECE IN C MAJOR

ON THE FIRST AND SECOND STRINGS



SIMPLE PRACTICE PIECE IN G MAJOR

ON THE SECOND AND THIRD STRINGS



THE MANDOLIN SELF-TAUGHT

IN CONSTRUCTION, and in the general theory of playing, the mandolin closely resembles the violin. It is composed of two parts: the body and the neck. The body is shaped peculiarly, having a pear-shaped back, and a flat top, instead of the rounded back and belly of the violin. It has also one large round, or oval, hole between the bridge and the finger-board, instead of the two *S*-holes of the violin. In both instruments the strings are attached at the base to a suitable tail-piece, and are stretched between the bridge and the nut by attachment to pegs arranged on a board at the further end of the neck.

The strings, instead of being of catgut, as in the violin, are of metal, generally steel, and, although tuned to precisely the same fifths as the strings of the violin, are double. Thus there are two G strings, two D strings, two A strings, and two E strings. The method of stringing and tuning the mandolin is practically the same as already described in connection with the violin, to which the student may refer for guidance in this particular. Each separate pair of strings must be tuned in perfect unison, but this matter is comparatively simple after a little practice.

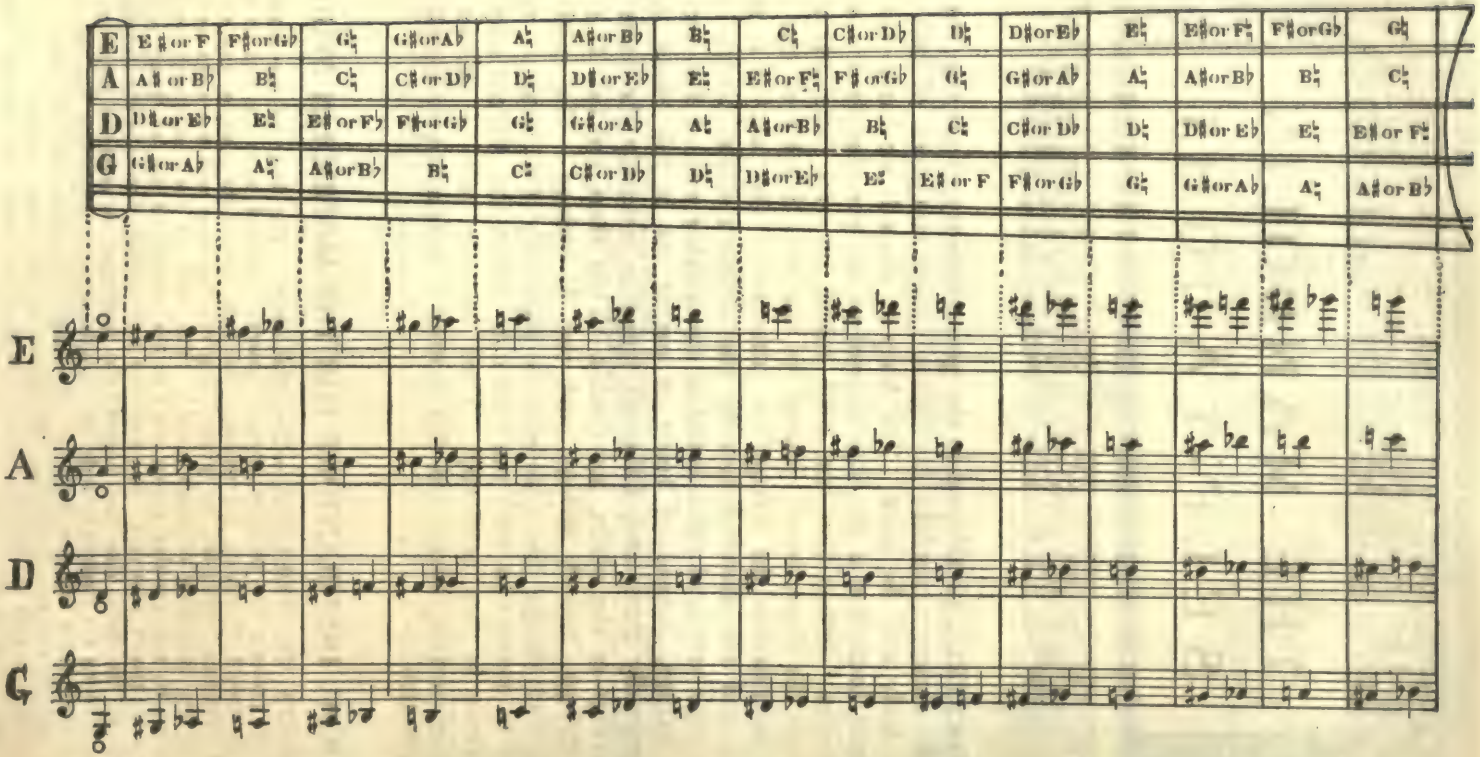
PRACTICAL INSTRUCTIONS FOR THE MANDOLIN STUDENT

THE FRETS OR TOUCHES.—The mandolin presents the primary advantage to the student of having the various tones and semitones indicated by proper frets or touches, consisting of small metal pieces inserted in, and running across, the finger-board at proper intervals. For two instruments of the same size, the proper position for making the various sounds are the same in both violin and mandolin.

HOLDING THE MANDOLIN.—In playing, the mandolin is held so that the fingers of the left hand may produce the various tones by stopping the strings at the frets, as in the violin. The body of the instrument, however, is held upon the lap or against the right side of the body, so that the playing may be done with the right hand.

The neck of the instrument should lie in the middle of the left hand, supported by the thumb and slightly balanced by the forefinger, in order to admit of easily running over the keyboard. The hand should be kept somewhat off the neck, without strain at the joint, so that, in the act of stopping the keys, the fingers may fall straight downward on the strings.

THE PLECTRUM.—The mandolin is played



LAYOUT OF THE KEYBOARD OF A MANDOLIN, SHOWING FRETS CORRESPONDING TO WRITTEN NOTES

by the use of a small piece of horn or quill, known as the *plectrum, pen,* or *pick.* This should be held lightly between the thumb and the first joint of the second finger of the right hand, so as to be perfectly perpendicular to the string, and follow the motion of the hand, which should always be flexible at the wrist. The motion of the plectrum is always guided by the hand and wrist, except in execution of *tremolos* and successions of small notes, when the forearm is brought into action.



In most playing, however, the right hand should rest lightly on the sounding-board (or harmonic board), supported by the little finger, between the sound hole and the bridge, and maintaining this position as long as possible, except in execution of movements requiring that the hand be lifted from the board.

THE STROKES.—In producing each individual sound indicated in the written music, the plectrum is brought against both strings of each key; the movement being alternately a downward and an upward stroke, as indicated in music for beginners on the instrument.

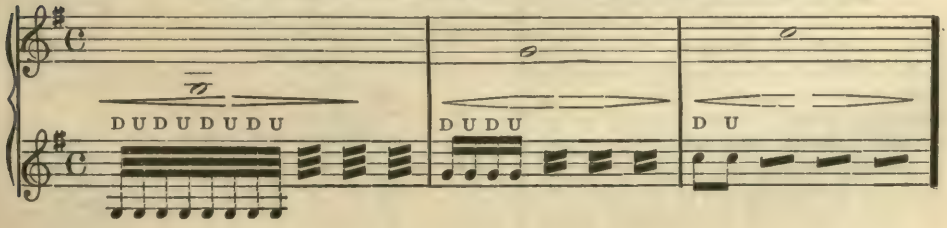
As already noted in the section on the violin, the performance of whole notes involves a *crescendo* and *decrescendo,* each during one-half the time indicated, in order to complete the full value of the note. With the mandolin, however, while the whole note is performed with a similar movement, the plectrum necessarily making a number of detached sounds, no matter how rapidly it is manipulated, plays the whole note at a series of thirty seconds, with an alternating *crescendo* and *decrescendo.* This is indicated in the accompanying diagram.

CHORDS.—In playing chords indicated in music for the mandolin, it is, of course, impossible to sound all the tones at once, as may be done with the bow of a violin. The rule, therefore, is to make the necessary keys, by stopping the strings, and to strike each one in rapid succession, from the lowest to the highest, with a quick and elastic stroke. This must be done so as to give, as nearly as possible, the effect of several tones sounded at once, as on the piano.

POINT OF STRIKING THE STRING.—Although there is necessarily considerable more latitude in performance than on the violin, the same general rules hold good for both instruments. Thus, while in most playing, the strings are struck by the plectrum near the lower edge of the sound hole, greater power is attained when the stroke is made nearer the bridge, and, correspondingly, a softer and sweeter tone results by striking near the finger-board. It is necessary to carefully consider these facts, since it is very seldom advisable to produce greater volume of sound by striking the strings with a greater strength. Such an action is liable to mar the effect of the playing, and is not artistic.

ON STOPPING.—In stopping the strings, it is necessary to observe the rule of pressing the fingers straight down *between* the frets, so that the string is shortened at the fret and rests between it and the bridge. By this means a superior purity of tone is produced, and it only remains to complete the effect by the even and flexible application of the plectrum. In practicing both fingering and playing, it is desirable to *begin slowly, and to play with the utmost deliberation,* strictly observing the rules.

WHOLE NOTES IN THIRTY-SECONDS, SIXTEENTHS AND EIGHTHS, GIVING MOVEMENTS OF PLECTRUM



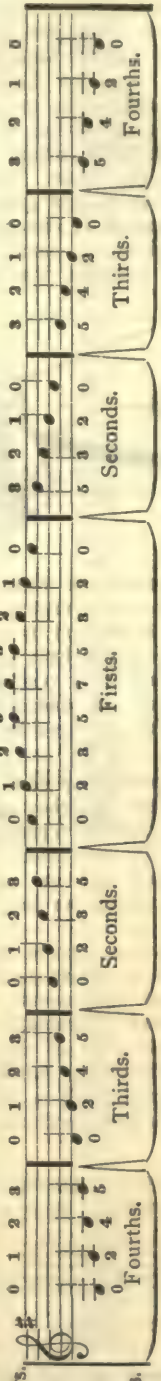
IMPORTANT MOVEMENTS. — Among the most important movements in mandolin music is the *tremolo*, which is to be played by a rapid series of alternating up-and-down strokes of the plectrum, to the full value of the note as written. These alternating strokes must be perfectly even, both in time and in the force with which they are delivered. Indeed, next to the fingering of the scales, the movement of the plectrum, in performing *tremolo* movements, is the most important subject for practice on the mandolin. The *trill* is produced in the same manner as the *tremolo*, and in both cases the movements of the fingers of the left hand, in stopping the strings, must be completely simultaneous with the movements of the plectrum.

SHIFTING THE STRINGS.—In the execution of music covering the wide range of tones, and requiring movements from one string to another, practically the same rules hold for the mandolin as have already been given for the violin. These are, that the left hand should be kept upon one string as long as possible—which is to say, as long as no very great changes of position are required, and so long as the transition from one string to another is not rendered inconvenient. In general, we may say that, with both instruments, the music is executed on one string, unless a succession of higher notes is to follow, which will render it necessary to shift the hand. While general directions for playing movements having a wide range of tones are given in most instructions for the mandolin, the question of what string should be used, in the production of a given tone in a given succession, may be left largely to the trained intelligence of the practiced player. In order to enable the player to readily make transitions from note to note, and from string to string, and to judge correctly whether to form a tone on the seventh stop of one string, or with the next one open, it is necessary that he be thoroughly trained in fingering and in executing the scales and runs.

SHIFTING THE POSITIONS.—The playing of the scales involves another necessary point in the execution of music on the mandolin, which is the shifting of the position. Briefly described, the change of position means the shifting of the hand up the string, so as to move the first finger one tone or semitone higher

COMPLETE SCALE IN G MAJOR FOR THE MANDOLIN

The notes are to be produced by alternate down (D) and up (U) movements of the plectrum. Other scales are precisely like those shown for the Violin, in point of fingering and touches



SCALE IN THE FIFTH POSITION, MOVING FROM THE FIRST AND BACK



for each succeeding position. Thus, for the fourth, or G, string, the first position finds the first finger on A♭; the second, on A; the third, on B♭; the fourth, on B. On shifting to form the second position, the first finger falls on B♭ or B♯; in the third position it falls on C or C♯; in the fourth position on D♭ or D♯, etc. These successive changes of position, of course, involve corresponding changes in the key of the scale beginning on the note made by the first finger. Thus, the second position on the fourth string is in the key of B♭; the third position in the key of C; the fourth position in the key of D; the fifth position in the key of E♭; the sixth position in the key of F, etc., provided the scale be run from the key governed by the first finger.

Ornamental Movements.—In making the movements, known as *glissando* or *portamento,* the motion of the plectrum is continuous, while the finger that is stopping the string slides up only until it reaches the semitone above that which is to follow, thus giving opportunity for the next finger to fall upon and stop the note required. In making *slurs,* only the first note of the two connected by the brace is to be struck with the plectrum, the second one being sounded only accidentally as the finger changes position. In descending *slurs,* the first note is struck with the plectrum, and the string is then pushed by the finger that is already stopping it.

In playing *staccato* and *legato* movements, the fingering is quite as important an element as the manipulation of the plectrum. The grace note, however, is struck by a short and sharp movement, which is distinct from that followed in the production of other notes of the same indicated value.

THE GUITAR SELF-TAUGHT

ACCORDING to an easy method of classification, there are three ordinary types of stringed instruments. The first includes instruments of the violin class, such as the violin, violoncello, bass viol, viola, etc., which are played with a bow. The second class is represented by the mandolin, which is played with an instrument called the plectrum or pick. The third class includes the guitar, banjo, lute, and several other instruments, mostly obsolete, which are played by plucking the strings with the fingers, as in the harp, zither, etc.

The modern guitar is an instrument which, in its general form, suggests the violin. Like the latter instrument, it consists of two parts: the body and the neck. At the end of the neck is the peg-board, holding the pegs for attaching and stretching the strings. The body, however, is formed flat on both the front and rear faces, and has a single sound hole, or "rosette," in the centre of the sounding-board. As in the violin and mandolin, the strings, stretched by tension at the pegs, hang free between the nut and the bridge. Unlike these instruments, however, the strings are attached to the bridge, instead of to a tail-piece. The various tones are produced by the stopping of the strings at the frets, which are metal strips fixed across the finger-board at proper intervals.

PRACTICAL INSTRUCTIONS FOR THE GUITAR STUDENT

THE STRINGS AND OPEN TONES.—The guitar has six strings, which, as in the violin and mandolin, are arranged to run up the scale from left to right; the finest string being the last to the right and the coarsest, the last string to the left. As shown in the accompanying diagram, the sixth, or left-hand, string represents the tone corresponding to the E below middle C, and the first string at the right, the E above middle C. From left to right, the strings correspond to the following open tones: E, A, D, G, B, E. Thus the intervals between the 6th and 5th; 5th and 4th; 4th and 3d; 2d and 1st are fourths, and that between the 3d and 2d is a third. The guitar is always tuned to these tones except for the playing of some Spanish pieces, fandangos, etc., which require a somewhat different tuning, as will be explained later.

The three lower strings (4th, 5th, and 6th) are generally made of brass or silver wire, or occasionally of silk, and the three upper strings (1st, 2d, and 3d) of catgut.

THE CORRECT POSITION IN PLAYING.—In playing a guitar, the correct position is to sit with the left foot slightly elevated, as on a footstool, and with the right thrown somewhat outward. The instrument is held

in the left hand, pressed slightly against the body, being balanced by the right arm between the wrist and elbow. The neck is held between the upper point of the thumb and the lower part of the forefinger of the left hand. This allows the four fingers to hang over the first four frets in the first position; being conveniently disposed, at the same time, to assume the other positions, as will be presently explained. The various tones are formed precisely as in the mandolin and violin, although, on account of the peculiar character of the instrument, there are several methods of stopping and touching, which are very seldom, if ever, used in the former instruments.

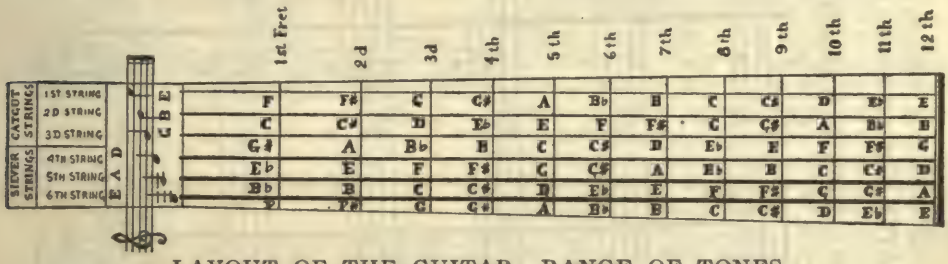
THE USE OF THE RIGHT HAND.—The playing is done by the right hand, which rests at the middle of the forearm on the edge of the instrument, so as to enable the fingers to touch the strings midway between the sounding-board and rosette. The playing is done with the thumb, first, second, and third fingers. The fourth finger is practically never used in ordinary playing, but should not be placed against the sounding-board, as a support to the hand, since this practice tends to interfere with the grace and ease of movement. The thumb always strikes the lowest note of a chord, and also the lowest string in any scale or succession of tones. This rule applies whether the lowest string be of wire or of gut. In picking the strings, only the ends of the fingers should be used.

MARKS FOR DOUBLE FINGERING.—In marking the exercises for the guitar it is necessary to indicate fingering for both hands. The plan generally adopted, therefore, is to designate the open strings by zero (0), and the first, second, and third fingers by 1, 2, 3, respectively. In the right hand the thumb is indicated by (X); the first finger by one dot (.); the second by two dots (..); the third by three dots (...).

STOPPING AND SHIFTING.—In stopping the strings with the left hand, and in shifting from one string to another, the same general rule holds for the guitar as for the violin and mandolin. This prescribes that one string should be used as long as possible—which is to say, as long as no very great *shifting of position* on the one string is required. Generally, however, in scales and runs, or where there is a succession of notes, rising in one direction or falling in another, it is preferable to use the open tone, when it is reached, instead of stopping at the proper fret on the string below. This rule is formed on the basis of experience, and indicates the method found most suitable for attaining ease of playing and good effect.
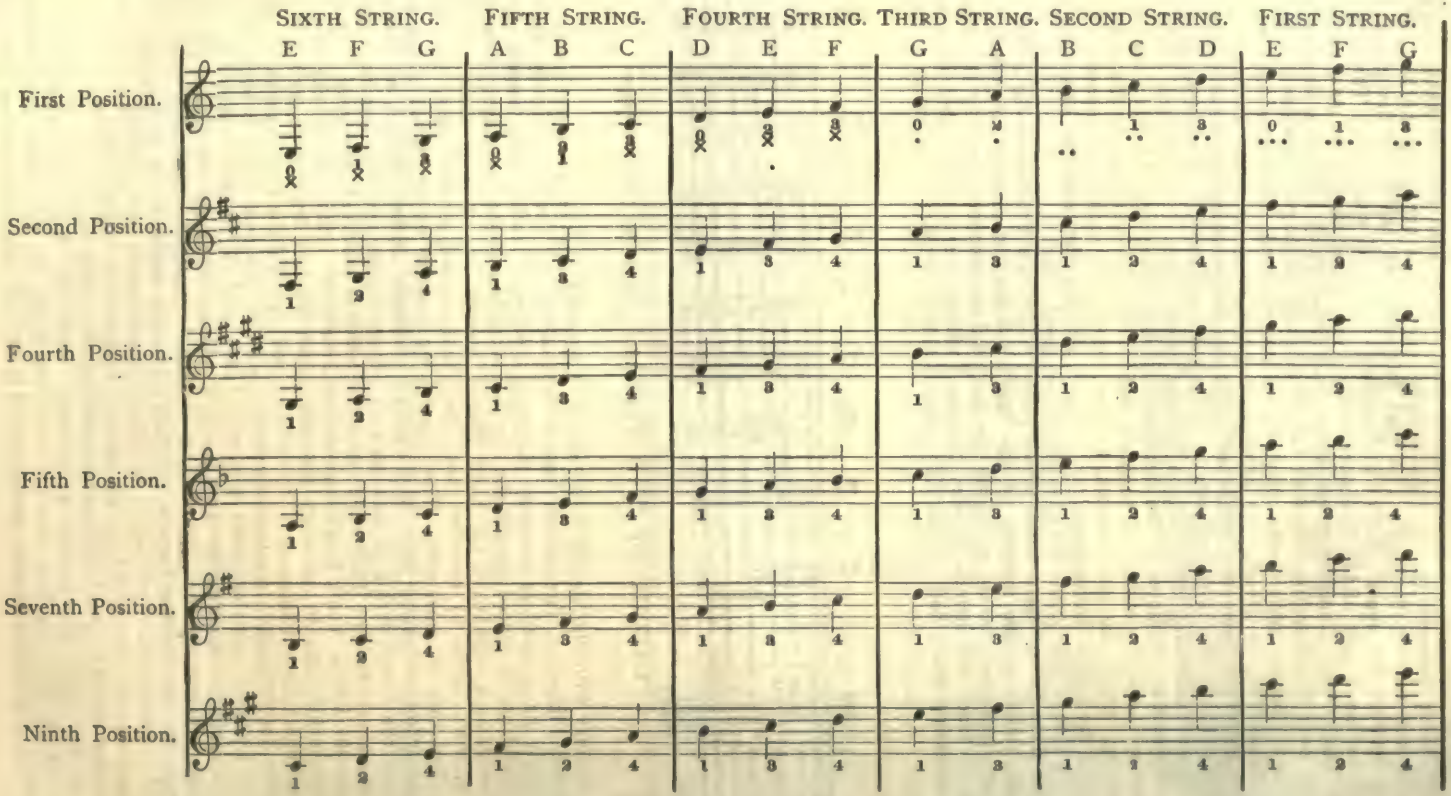
ON THE POSITIONS.—In order to acquire a facility in playing the guitar, it is essential to practice, not only the scales in the various keys, as in other instruments, but also to acquire a facility in playing on the different positions, and in shifting from one position to another. Briefly explained, a position is called first, second, third, etc., according as the first finger of the left hand "governs" or is in position to stop at the first, second, or third fret, etc. In changing position on any given string, the hand is simply shifted upward, so that the first finger comes over the fret next above that which is previously governed. Thus, on the lowest, or sixth, string, the first position finds the first finger over the F fret, the second over F♯, the third over G; in the second position the first finger is over F♯, the second over G, the third over G♯. Thus, in running scales on the several positions the key is changed. This is an important point for the beginner to understand; since it shows him at the start the most convenient positions in which to play a piece written in any given key.

THE BEST KEYS FOR THE GUITAR.—While the range of the guitar is sufficiently extensive to allow of playing music in any



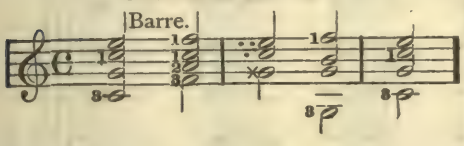
LAYOUT OF THE GUITAR: RANGE OF TONES

THE SIX POSITIONS MOST COMMONLY USED IN GUITAR MUSIC, WITH FINGERING FOR STOPPING AND PLAYING. LETTERING DESIGNATES THE TONES ON THE FIRST POSITION

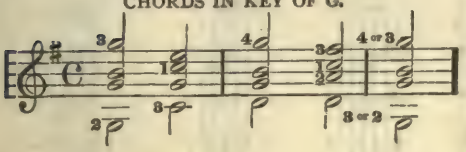


key, the rules governing correct performance determine that certain keys may be more easily rendered than others. The most suitable are, accordingly, the natural key of C *major,* and its relative, A *minor;* the key of F *major,* and its relative, D *minor;* the key of G *major,* and its relative, E *minor;* also, of D *major,* A *major,* and E *major.* The other keys are more difficult than those designated, and should be avoided when possible. As may be seen from the accompanying musical diagram, the five positions most used—to wit, the second, fourth, fifth, seventh, and ninth—

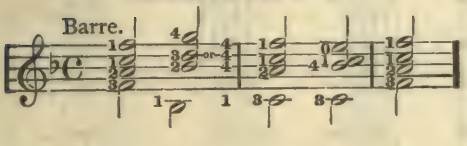
CHORDS IN KEY OF C.



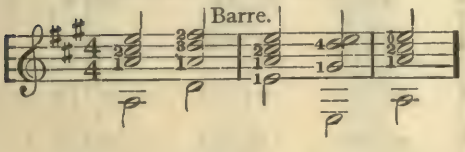
CHORDS IN KEY OF G.



CHORDS IN KEY OF F.



CHORDS IN KEY OF A.



correspond, respectively, to the keys of D, E, F, G, and A, as already indicated. In playing in other keys, it will be found necessary to use the *barre* more frequently than is convenient for the average player.

On Stopping the Strings.—In stopping the strings, the finger should press down firmly on the nut-side of the fret until another fret is to be stopped, unless the following note had best be given open on the same string. In playing scales, or a long succession of notes, it is desirable that the fingers be not raised too quickly. Neglect of this rule involves that the open string may vibrate, as the hand shifts from one to another string, thus marring the effect of the performance. In stopping the strings the same rule holds, as has been previously given for the mandolin, that the finger should press the string between frets so as to leave it free to vibrate fully, supported between the fret and the bridge. If the string is wrongly fingered, and the finger presses directly on the fret, the result will be a damping of the vibration, and a marked and disagreeable contrast between the open and stopped tones. On this account, it is particularly desirable that the student take regular exercises on the open tones, as, for example, in running the diatonic or chromatic scales on the first position, or, in the scale of C, as shown in the plan of the positions already given.
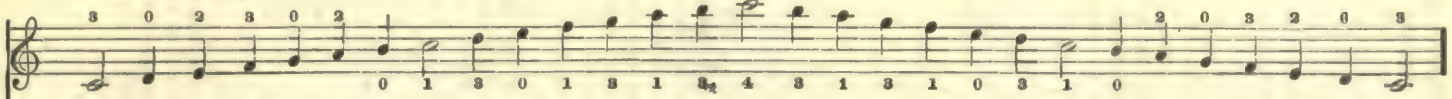
On Playing Chords and Arpeggios.—Owing to the manner of playing the guitar, it is possible to render a large number of ordinary chords of from three to six notes. A chord composed of three notes is to be played with the thumb and first and second fingers of the right hand, which may be used to pluck the three strings simultaneously. With a chord of four notes, the third finger is added to the other two, and the four strings are plucked simultaneously. When a chord of five or six notes occurs, the rule is that the two lowest tones are to be produced by the thumb sliding rapidly from the lower string to the next; after which the remaining three or four notes are struck simultaneously, in the manner just described. Very frequently a chord is played as an arpeggio, the strings stopped by the fingers of the left hand, or left on open tones, being struck one after another in rapid succession, so as to produce, as nearly as possible, the effect of being a simultaneous attack, as in the mandolin. The following example illustrates the method of playing a chord as an arpeggio, also the proper fingering. Of course, in playing a chord as an arpeggio, the strings remain stopped until the entire sequence has been rendered, or as many of them as possible are held down to the end. Thus, all of them continue vibrating at once. When an arpeggio occurs in a piece written to slow time, it may be fingered as in the annexed examples; but, when the movement is rapid, the thumb is run over the stopped strings, from the lowest to the highest; this movement being indicated by the slur.

The Barre.—The movement known as the *barre* consists in pressing two or more strings with the first finger on some given fret. A mechanical device known as *capo-*
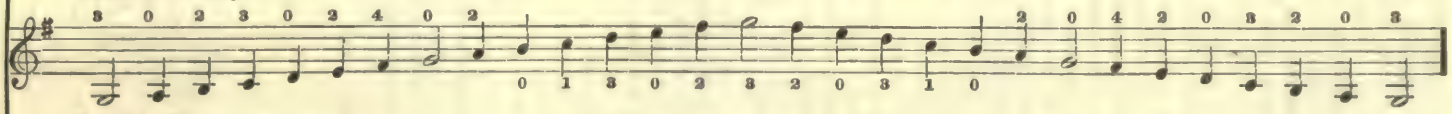
COMPLETE MAJOR SCALES IN THE MOST COMMON GUITAR KEYS, WITH CORRECT FINGERING FOR STOPPING

The right hand fingering involves the use of the thumb for the three lower strings and of the first, second and third fingers for the three higher

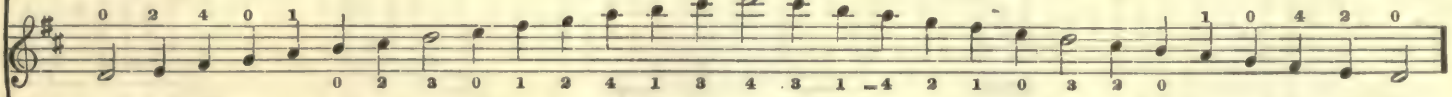
Scale in C major.
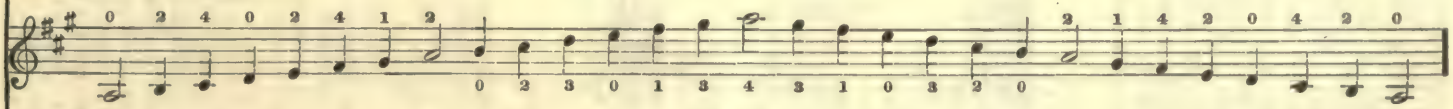


Scale in G major.



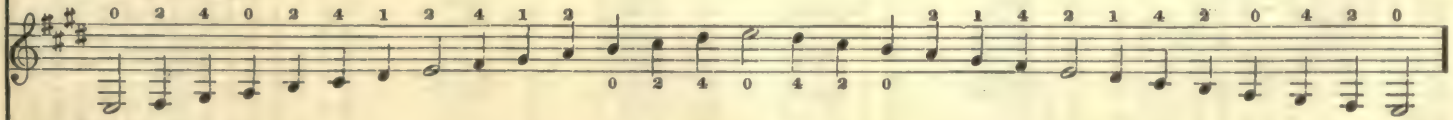
Scale in D major.



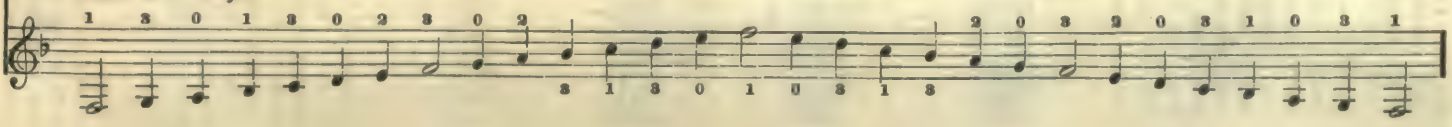
Scale in A major.



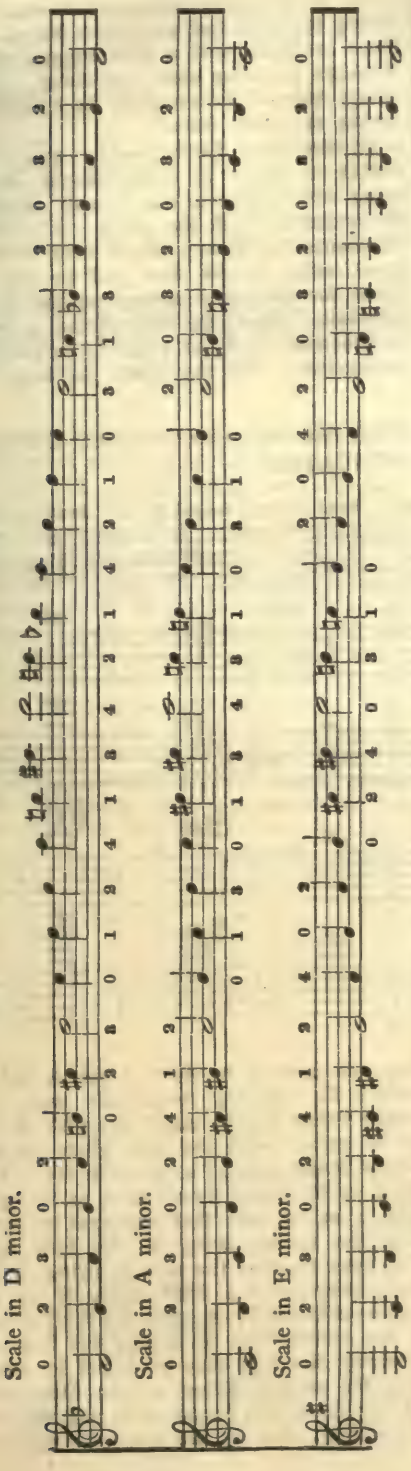
Scale in E major.
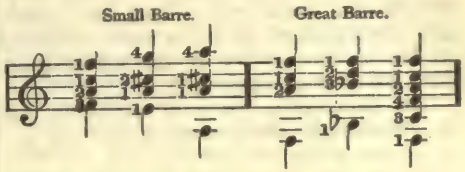


Scale in F major.



MINOR SCALES FOR THE GUITAR



dastro is also used. The effect produced is to shorten the vibrating range of the string so that by stopping it lightly sounds may be produced somewhat higher than those naturally obtained by stopping at the same frets. Of course, the pressure of the first finger must be very strong, being reinforced by the thumb on the under side of the neck. There



are two kinds of *barre;* the small, when two or three strings only are stopped in this manner; the great, when all six are stopped. Examples of both occur in the above diagram.

Triplets and Sextolets.—In accompanying the voice, or another instrument, triplets and sextolets are frequently introduced into the music, in order to improve the effect. Such a movement should be carefully practiced, as well as the chords, with the fingering, since they are among the most important elements of the guitar.

On Playing Slurs.—Another point necessary to be understood is the manner of playing slurs. As is well known, there are two kinds of slurs: (1) the ascending, in which the movement is from a lower to a higher note; and (2) the descending, in which it is from a higher to a lower note. In playing an ascending slur, the correct procedure is to pick the string, properly stopped, for producing the first note, and immediately to place the finger in position for making the second note, without picking the string to produce it. To play the descending slur, strike the first note with the right hand, and, on stopping the string to form the second, snap it with the finger of the left hand, thus producing the second tone at about the value required. In similar manner, the slide or glide is produced. A series of notes being indicated to be played *glissando,* the lowest is stopped by the first finger of the left hand, and, after it has been struck by the right hand, the succeeding notes are produced by sliding the left up the neck of the instrument, over all the frets, until the proper position for making the last note is reached. Grace notes are also played with the slurred effect.

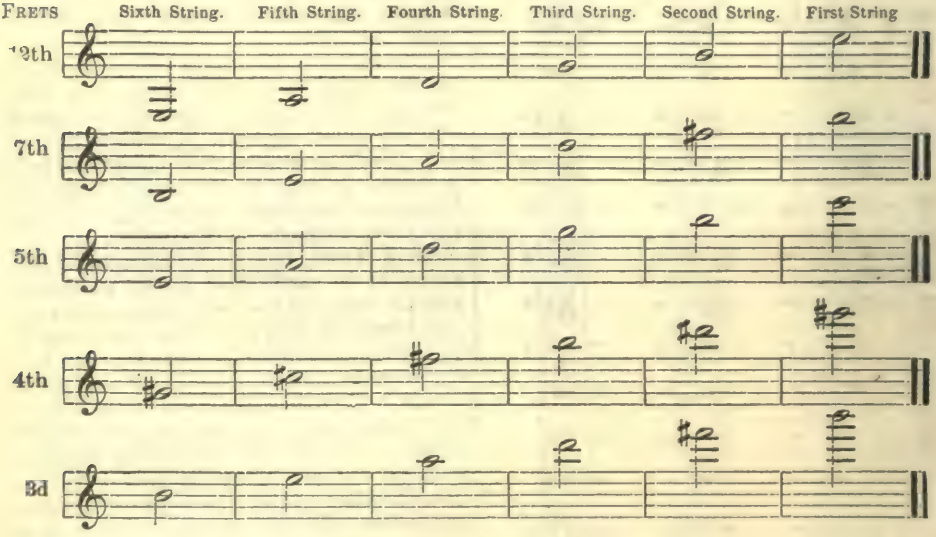
On Harmonics.—The final embellishment

used in guitar music is the production of that known as harmonics. A harmonic is usually an octave higher than the tone indicated in the written music, and is produced by touching the string at the proper fret with only sufficient force to prevent it from vibrating on the open tone; thus producing a pleasing flute-like note. Harmonics may be produced on every string of the guitar on the twelfth, seventh, fifth, fourth, and third frets. They are generally distinguished from the note indicated in the written music by the abbreviation *har.*, or a small circle (°).

The explanation given by physicists for the production of harmonics, as just explained, is that several strings of the same length, whether of the same diameter or not, vibrate with the same "amplitudes"—which is to say, "belly out" to about the same distance on every side. Each string, however, vibrates in a succession of such "loops," as has been proved repeatedly by experiment; leaving inactive spaces, or "nodes," between the several loops. If, therefore, a vibrating string be touched at any point on a loop, its sound will only be muffled, or damped. If it is touched on a node, the vibration may continue, and a clear tone be produced. Thus, in sounding harmonics on the guitar, the player merely touches the string at nodal points, which occur at the frets designated above; producing tones pitched an octavo higher than those occurring with a fully stopped string, although sounding clear and sharp. These effects may not be produced by similar fingering on other frets.

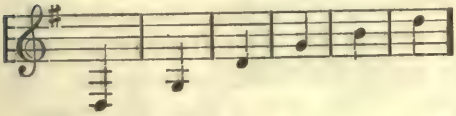
TUNING THE GUITAR.—The process of tuning a guitar is comparatively simple, being very similar to that already described in connection with the violin. In both instruments the usual custom is to tune the open string of A♮ first and to find the tones for the other strings on the proper intervals. Thus, the fifth string is tuned to the tone of A, as given by a piano or tuning-fork. On the piano the tone corresponds exactly to that of the A below middle C. Having found this tone, the fourth string may be tuned to a fifth above, or in unison with the tone given by the second string stopped at the fifth fret. The third, or G, string should give, as its open tone, a unison with that produced by stopping the fourth string at the fifth fret. The open tone of the second string, however, being only a third above G, or B, may be obtained by stopping the third string at the fourth fret. In tuning the first, or E, string the tone may be found by stopping the second string at the fifth fret. Having found the proper open tone for the first string, that of the sixth string may

TABLE OF TONES GIVING HARMONICS AN OCTAVE HIGHER OR AT THE FRETS INDICATED



be readily obtained, by tuning the two into unison; the tones being exactly two octaves apart.

Special Tuning Schemes.—The tuning, as just given, is the one adopted in playing most music for the guitar. Certain Spanish pieces, however, require different tunings, in order to simplify the manipulation of the instrument. It is necessary, therefore, in buying sheet music, to carefully



observe the special tuning, if any, that is indicated at the head of the first page. Two examples of peculiar tuning are given herewith. The first follows the tuning most commonly adopted in playing the Spanish *fandangos, habaneras,* etc.

As may be seen, the sixth string is tuned to the pitch of D below middle C on the piano, or the D below the F in the *bass clef;* the fifth string is tuned to a fourth above, which is the G below middle C; the fourth string is the fifth above that, or the D below the line of the treble staff; the third string is tuned to a fourth above, or to G of the *treble clef,* the second string, to a third above, or B, and first string, also, to a third, or D.

In tuning the instrument to this scheme, therefore, it is first necessary to lower the open tone of the sixth string one whole note, making it D, in octave with the open tone of the fourth string. The fifth string is then lowered a whole tone to G, in octave with the open tone of the third string, the fourth, third, and second strings remaining precisely as in ordinary tuning, but the first string being lowered a whole tone so as to give D, or a third above the second. By this tuning the instrument may be played as under ordinary conditions, the distance between each pair of frets being still a semitone.

The second piece, included herewith, illustrates still another method of tuning, in which the sixth string has the tone of C next below middle C on the piano, or the



C of the bass staff; the fifth and fourth have each the tone of middle C; the third and second strings the tones of G, B, and E, as ordinarily.

While these exceptional tunings will not be met by the student, until his studies are considerably advanced, it is desirable to describe them in this place, in order that he may understand at the start one of the commonest experiences of the finished performer.

THE VIOLONCELLO SELF-TAUGHT

IN POINT of construction and general theory of playing, the violoncello is a larger form of violin. In fact, except for the difference in size, the same general description holds good for both instruments. As compared with the music for the piano or violin, it is a bass instrument; its tones on the open strings ranging through nearly two octaves from the second below middle C, and by stopping the strings, giving more than two octaves above. As compared with the bass viol, however, it reminds one of the relation between baritone and bass voices—the bass in both cases being characterized by the greater weight and body of tone.

On account of its greater size, the violoncello must be held and played differently from the violin. It also requires several other peculiarities of management.

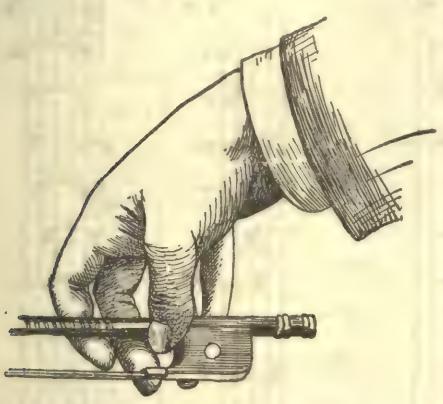
PRACTICAL INSTRUCTIONS FOR THE STUDENT

POSITION OF THE PLAYER.—In playing the violoncello, the performer sits rather forward in his chair and supports the instrument between his knees; its principal support at the rear being against the muscular portion of his legs. It is essential, however, that the belly of the instrument should be further forward than the performer's knees, in order that the movement of the bow may not be interfered with.

THE POSITION OF THE LEFT HAND.—The manner of holding the neck of the instrument with the left hand is, in general, very much the same as that already described for the violin. In other words, it is the duty of the left hand to support the instrument at the neck, at the same time allowing the fingers freedom for stopping the strings. To be more precise, the thumb of the left hand must grasp the back of the neck, at a point exactly opposite the second finger, as it touches the finger-board. In holding the fingers in readiness for stopping, they should be at least three-quarters of an inch above the level of the string; all of them curved, except the fourth, which is more easily held straightened. The fingers are supported by the third joint of the first finger, which rests against the side of the neck. This position renders it an easy matter to stop the strings strongly and quickly. In making some of the higher notes in the range of the instrument, particularly on the first string, it is necessary to remove the hand entirely from the neck, and to support the instrument wholly at the knees, at the same time using the thumb, by laying it across the strings at a convenient point, in order to support the hand, and assist the fingers in making stops.

HOLDING AND WORKING THE BOW.—The rules for bowing the violoncello are, in general, the same as those noted in connection with the violin, so far as applicable in playing, although the bow is differently held in the two instruments, while the effects to be obtained are somewhat different. In order to produce the proper effect in playing, the bow should be held slightly between the thumb and the two middle fingers. It is held, however, from the top of the stick, instead of from the side, as in the violin, the two middle fingers resting against the hair to give the hand a firm hold. The first finger of the right hand serves to regulate

he pressure of the bow upon the strings, by its degree of pressure on the stick, and, in so doing, performs the most essential part in the proper production of tone effects. The little finger of the right hand is placed near the nut of the bow, although
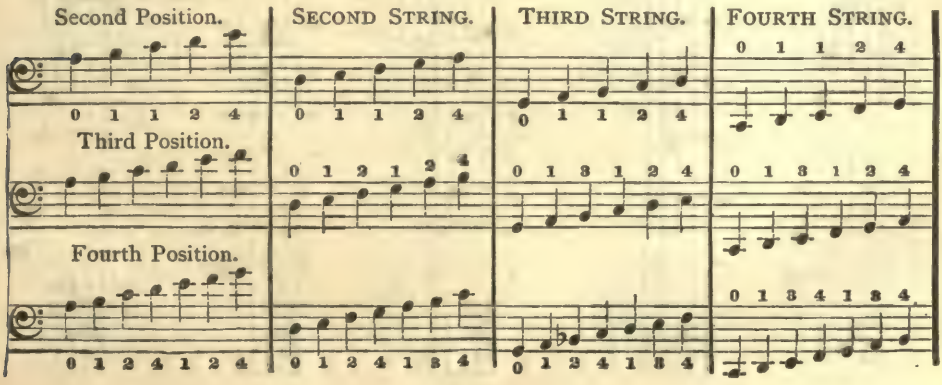


having no function in either holding or regulating its motions. The fingers should be about one-quarter of an inch apart, and all, except the first, be kept straight, in order that the knuckles of the hand may remain parallel with the stick as long as possible. As in playing the violin, the bow must touch the strings exactly at right angles to their length, the stick being inclined toward the finger-board, as in the violin, care always being taken to prevent it from touching the strings.

Apart from the rule of regulating the pressure of the bow with the first finger of the right hand, there are very few peculiar points that need be specified for bowing the violoncello. To produce a fine tone, the bow should be placed lightly upon the strings, particularly at the beginning of a note. In playing whole tones, the bow is drawn from end to end, but for short notes only a part of a stroke is used. As in the violin, the terms "up-bow" and "down-bow" are used to designate, respectively, the pushing and the drawing stroke. In playing scales and runs, the length of bow to be used for each note may be determined by its time-value; also, by the rapidity with which the fingering is done or the bow is moved.

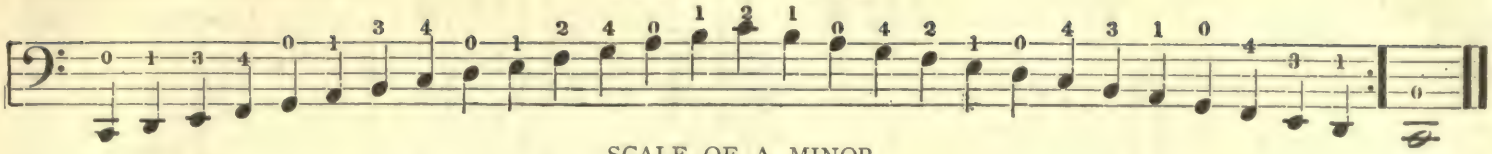
THE STRINGS AND TUNING.—As in the violin and mandolin, there are four strings on the violoncello. They are differently tuned, however, from the strings of other instruments, the tones ranging from the C of the second octave below middle C to the A next before it. The four strings, as in the violin, are tuned to perfect fifths, being respectively C, G, D, and A.

STOPPING THE STRINGS.—Owing to the length of the finger-board and the greater diameter of the strings on a violoncello, the touches for the proper tones are further apart than on any other stringed instrument we have thus far described. Thus, the first touch, for producing the semitone next below the nut, is over one and three-eighths inches up the string, while the touch for the first tone above the nut is nearly three inches up the string. In order, therefore, to hold the fingers in position for stopping four consecutive semitones, a considerable stretch is required, and the hand must be firmly held against the neck of the instrument. In playing upward runs and scales, the rule is to hold down the fingers already stopping the strings, even after the new tone is reached. Thus, in performing the descending scales, the fingers are raised, one after another, from the positions taken in performing the upward run.
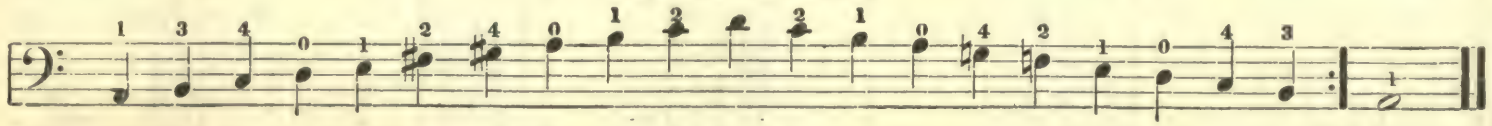
THE POSITIONS.—In shifting position, precisely the same principles hold as have already been described in connection with other stringed instruments. In order,



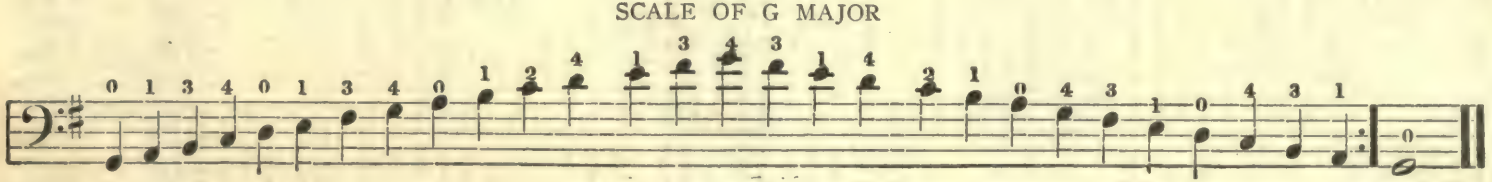
SCALE OF C MAJOR



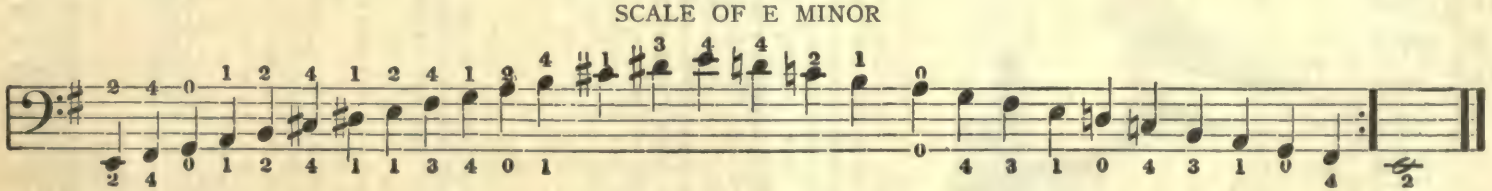
SCALE OF A MINOR



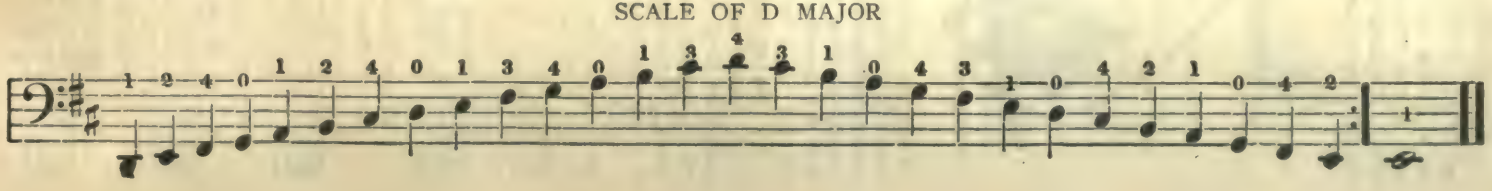
SCALE OF G MAJOR
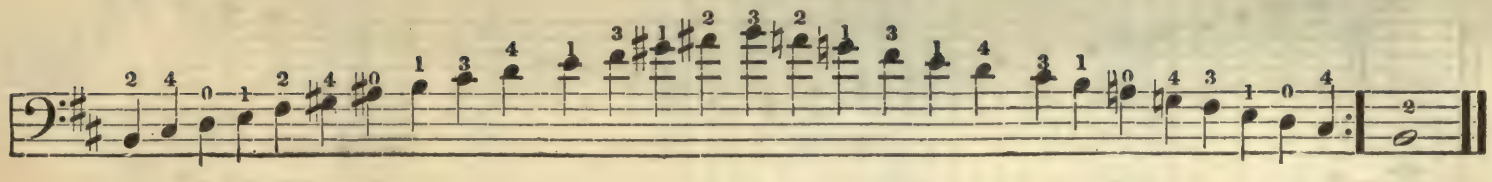


SCALE OF E MINOR
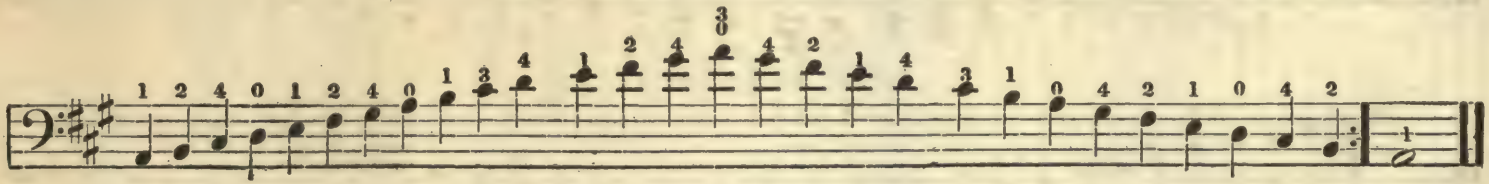


SCALE OF D MAJOR
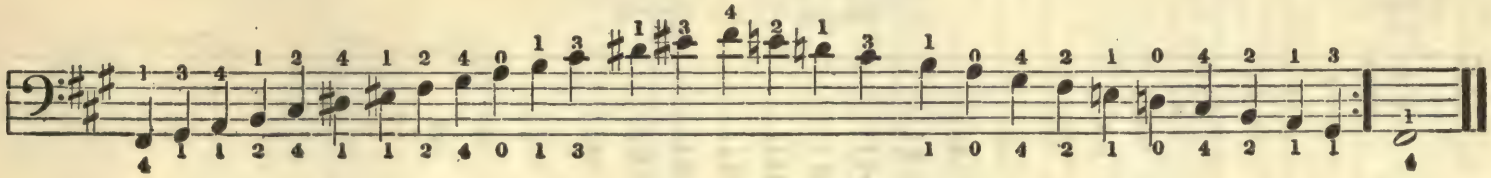


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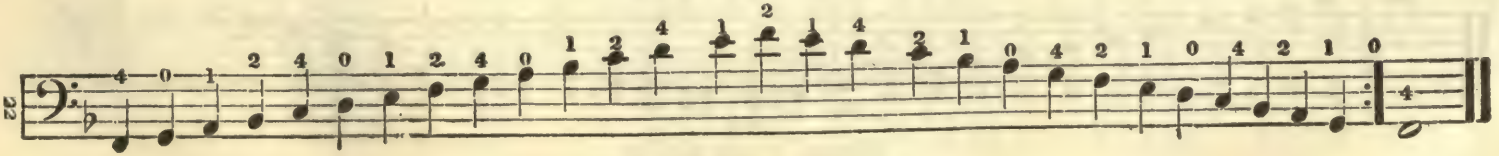


SCALE OF A MAJOR
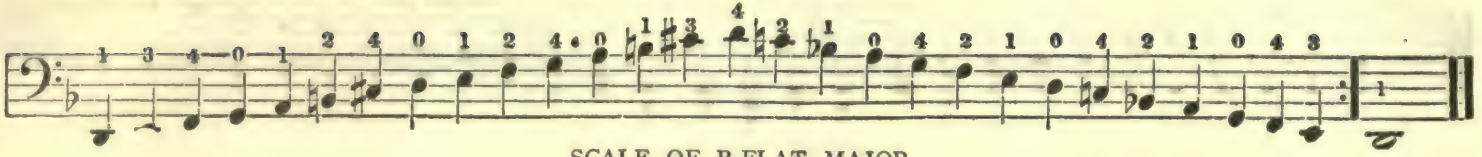


SCALE OF F-SHARP MINOR
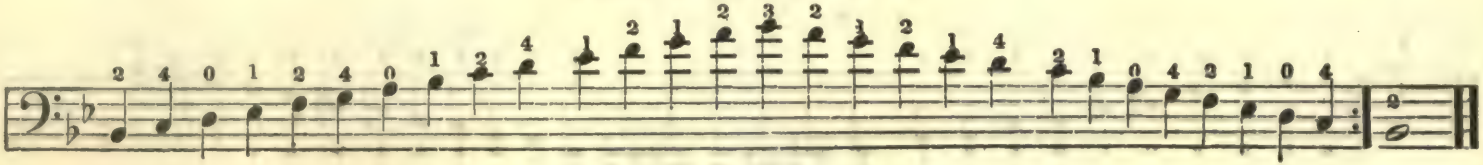


SCALE OF F MAJOR
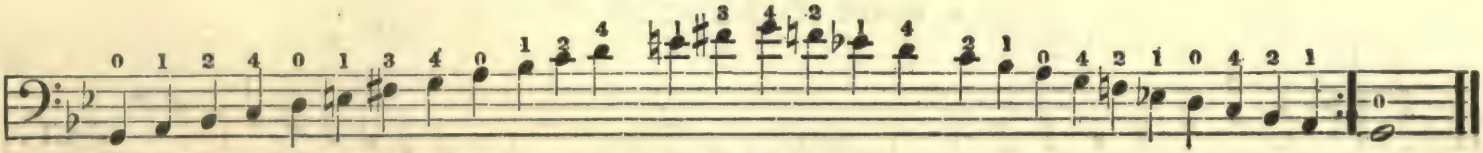


SCALE OF D MINOR
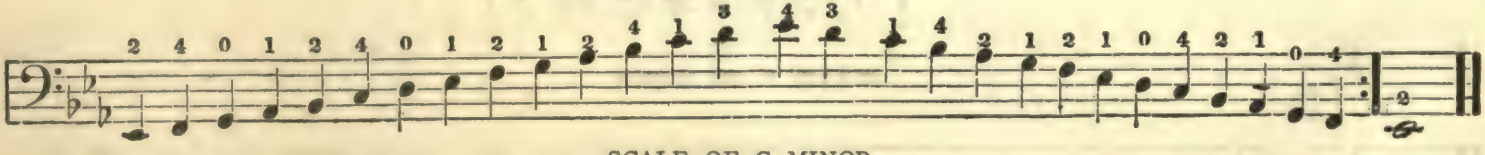


SCALE OF B-FLAT MAJOR
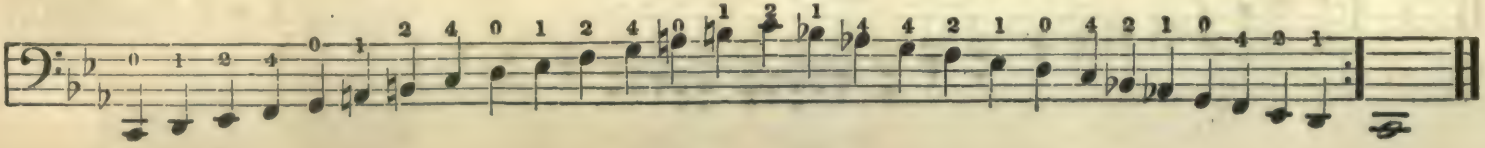


SCALE OF G MINOR



SCALE OF E-FLAT MAJOR



SCALE OF C MINOR
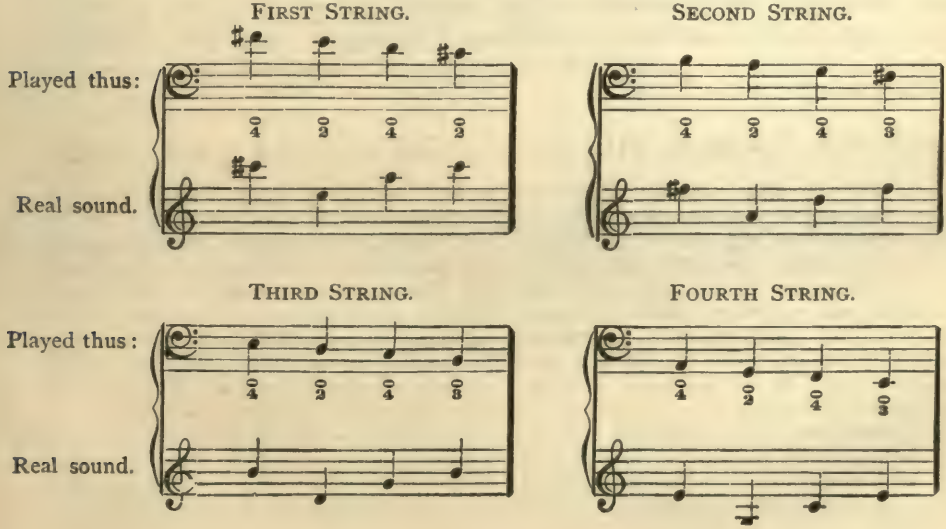


therefore, to stop a note that is beyond the reach of the hand held in the first position—which is to say, with the fingers ready to stop the strings at the first four semitones above the nut—it is necessary to shift a semitone, a tone, or even further up the finger-board, in order to reach and stop it. In playing a scale or succession of notes to a shift, it is necessary to change the fingering somewhat from that which would usually be followed, if the first position only were in use. Thus, in playing and rendering the scale of C, from the fourth to the first string, avoiding open tones, the fingering will be as given in the accompanying example. Here we see that the first touch above the nut is made by the first finger of the left hand, and, in order to shift a whole tone and stop three notes higher up, the first finger is shifted to the touch a tone above, and stops that tone; the second finger following to the semitone above, and the fourth finger on the whole tone next above that. The same fingering applies to the playing of the remainder of the run through the other three strings. However, in taking the third position on each string, in which five tones below the nut are to be stopped in each, the fingering is changed, so that the first and third are used in the first position, and the first, second, and fourth, in the second, on making the whole shift. Similarly, in making the runs on the fourth position, so as to include six whole stops below the nut, the first, second, and fourth fingers, or the first, third, and fourth, are used in stopping on the first position; and the first, third, and fourth, after the shift, except on the first string. In the fifth and other positions, the touches are so much closer together that the first, second, and third fingers may be used throughout, thus greatly simplifying the production of long runs, and rendering the work of stopping much simpler.

Staccato and Spiccato Movements.—In the production of *staccato* movements, the several notes are sharply detached under a single stroke of the bow. The proper motion may be obtained by pressing the bow lightly with the first finger. Considerable practice is required to enable the performer to strike the *staccato* notes sufficiently short and distinct. A movement, somewhat similar in effect, is that known as *spiccato,* which is performed in the middle of the bow, held against the strings with an elastic contact, but receiving a continual jumping movement, by quick up-and-down movements of the wrist. As in the case of the *staccato,* the notes must be made as short as possible; the bow being kept moving up and down, as it were, by the movement of the wrist, and making mere touches in alternate directions, in order to produce consecutive notes.

Harmonics.—Like the guitar, music for the violoncello regularly uses harmonics to

EASY HARMONICS ON THE FOUR STRINGS
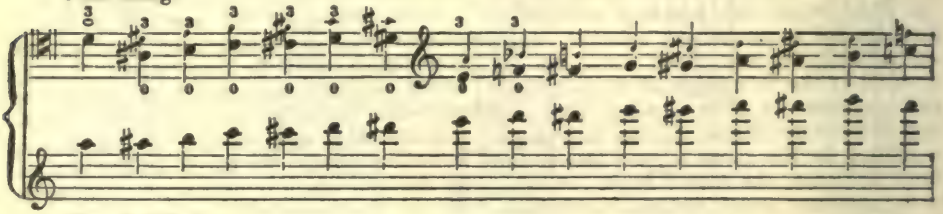


several different tones. There are two varieties of harmonics recognized in this instrument; to wit, natural and artificial. Natural harmonics are produced by touching the string lightly on certain notes with a finger of the left hand, and striking the string, thus stopped, with the bow, also held lightly. Artificial harmonics are produced on the higher tones by setting the thumb firmly on the string and touching the fourth degree above lightly with the third finger of the left hand. This produces the sound of the second octave above the note that would usually result, if the string were regularly stopped at the point touched by the thumb.
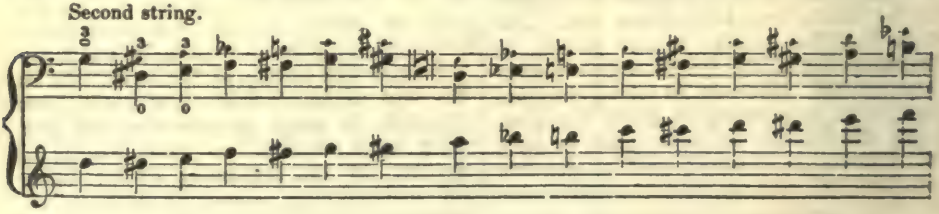
ARTIFICIAL HARMONICS ON THE FIRST AND SECOND STRINGS

Upper staffs show how they are played; lower staffs how they sound

First string.



Second string.



THE CORNET SELF-TAUGHT

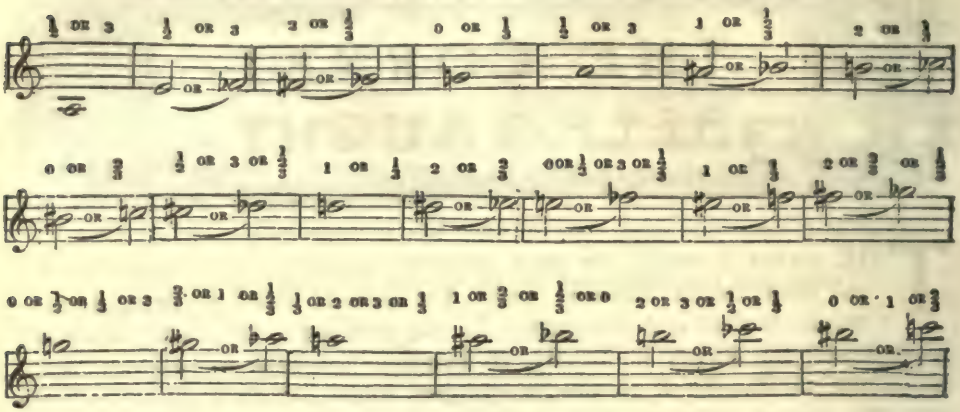
THE cornet is nearly the most familiar example of the class of musical instruments included under the general head of brass instruments, horns, and trumpets. In the production of music in a horn or trumpet, the theory is, briefly, to lengthen the tube to produce lower tones and to shorten it to produce higher tones, which is in accordance with the theory followed with stringed instruments, as we have already seen. Bearing this fact in mind, we may understand that the slide trombone is the type of the brass instruments, since its varying tones are produced by sliding the two straight ends of a U-shaped portion of the tube inward or outward, thus shortening or lengthening the channel through which the breath is forced in producing the sounds. With keyed trumpets, like the cornet and other band instruments, the lengthening and shortening of the tube is accomplished by opening and closing keys, or valves, leading through coils of tube; thus giving the proper length for producing the desired sound.

In addition to the several devices employed for varying the length of the tube of a brass instrument, we must also have such variation of the force with which the breath is sent through the mouthpiece, and such skilful management of the lips, as shall secure the correct tone when the proper length of tube has been provided. In fact, these latter elements are really the most important things to be understood and mastered, since, otherwise, it is very frequently impossible to produce all the tones in any key, even with the proper adjustment of the valves.

PRACTICAL INSTRUCTIONS FOR THE CORNET STUDENT

THE VALVES AND TONES.—The cornet has three valves, which are operated by the first, second, and third fingers of the right hand; being called the first, second, and third valves, respectively. As already explained, the act of pressing down a valve lengthens the tubing and lowers the pitch below an open tone. Thus, by manipulation of the first valve, the pitch is lowered a whole tone; by the second valve, a half tone; and by the third valve, three half tones, or a tone and a half. It is, therefore, a simple matter to produce the consecutive notes in the diatonic scale, if the performer (1) is thoroughly familiar with the intervals of the scale, and (2) is well practiced in the proper use of the lips and breath. It is not necessary, however, to use the valves in the production of all consecutive tones, since the skilful performer can produce a number of different tones, both open and with the use of either one of the valves, any two of them, or all three together. Furthermore, as is shown by the accompanying examples, there are several tones in the available compass of the cornet that may be produced by two or even three different combinations of valves or open

TONES PRODUCED BY TWO OR MORE COMBINATIONS



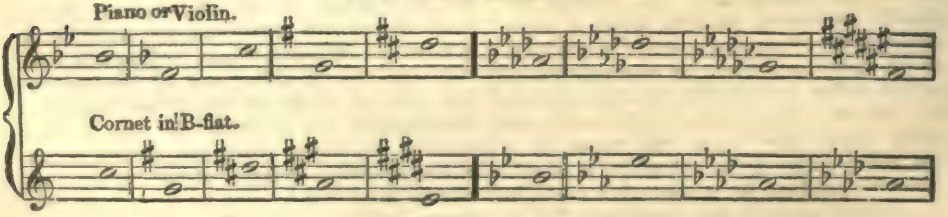
tones; and no less than five different notes that may be produced in four distinct ways. However, the combinations given in the chromatic scale are those that have been found altogether the most convenient and easiest to render.

Open and Valve Tones.—As shown in the accompanying chromatic scale, the following tones may be produced open: The C below the treble staff; the G on the second line; the C next above, the following E and G, and the C above the line. The first valve controls the production of B♭ below the line; the F on the first space; B♭ on the third line; the D, F, and the F♭ above. Similarly, also, the second valve controls the production of six different tones. The third valve may be used in the production of seven distinct notes, but is seldom used alone, except for the sake of convenience in fingering, when producing rapid runs and difficult passages.

The Pitch of the Cornet.—There are several different pitches to which the cornet may be tuned. The pitch of B♭ is the one most commonly used in ordinary concert work, although the instrument is occasionally tuned to the key of A. Both keys are used in orchestral work. In military bands an E♭ cornet, which is tuned to a minor third above actual pitch, is frequently found, on account of its ability of enabling the performer to reach a higher pitch. The B♭ cornet is, of course, the easier one to play, and is therefore the one most commonly used in learning the instrument.

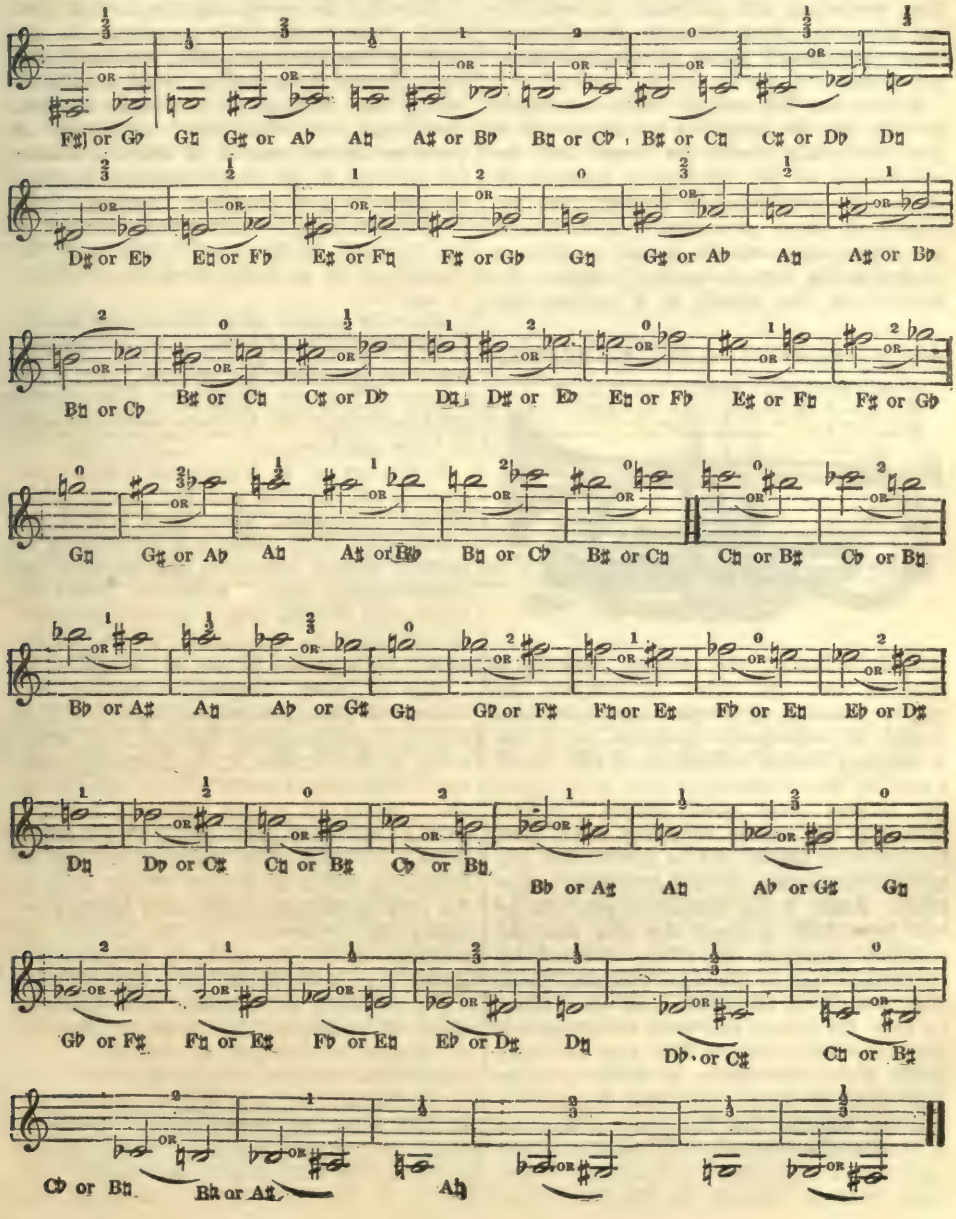
The Lips and Instrument in Playing.—In playing the cornet, the lips must be held in a position best to be described as flat over the teeth. This enables them to act as a form of reed, for the variations of the tone blown into the mouthpiece of the instrument. The upper lip should properly vibrate more than the lower, and, by learning to use it properly at the start, a purer and more resonant tone may be secured. In order to obtain the best results, however, using as little of the upper lip as possible, it is necessary to hold the instrument perfectly horizontal. The horizontal position is adopted in order that the pressure of the mouthpiece against

RELATIVE PITCHES OF CORNET AND PIANO OR VIOLIN IN PLAYING ACCOMPANIMENTS



the lips may be regulated. In the production of the higher tones, the pressure is sometimes very strong, thus rendering it in every sense desirable that it be evenly distributed. The necessity of using the lips in the production of tones is the one element that renders the cornet difficult to play, and, also, for the enthusiastic student to learn. This apparent anomaly is due to the fact that too incessant practice, particularly in the higher tones, results in what is usually described as "blowing-out." This consists simply in the crushing of the lips, so that they become, for

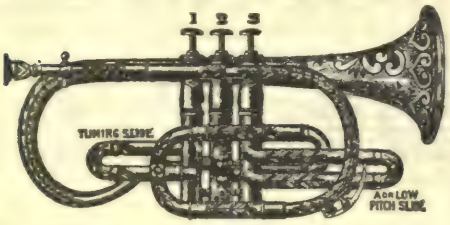
COMPLETE CHROMATIC SCALE OF A B-FLAT CORNET, GIVING VALVE FINGERING AND NAMES OF NOTES



the time being, incapable of performing their functions. On this account, it is particularly desirable that the beginner should apprehend the fact that the greater part of his primary practice should consist in production of the lower tones. In addition to saving his lips, the practice of these tones gives him quite as great a facility in the management of the instrument, and also in the reading of notes; at the same time rendering him proficient in performing the notes most often neglected, hence most often poorly given by otherwise good performers.

RULES FOR BREATHING.—The fundamental rule for the beginner on the cornet is that the breath should be forced into the mouthpiece of the instrument without inflating the cheeks or protruding the lips. Either of these practices will injure, if not entirely prevent, the proper production of tones—the first, because it subjects the muscles of the mouth to a useless and

B-FLAT CORNET SHOWING SLIDES AND VALVE-KEYS, 1, 2, 3



painful pressure; the second, because it prevents the lips from discharging the proper function of a vibrating reed. Although a considerable pressure of breath is required in the production of the higher tones in the compass of the instrument, the student must learn, among the first things, if not as the very first thing, that the pressure should not be given with any unnecessary strain on the breathing apparatus. After a few weeks of practice, he will have fully grasped the idea that the required force is an effect obtained by the proper use of the lips, combined with the pressure of the instrument upon them. In fact, the higher the tone, the greater is the compression of the lips, and the more firmly is the mouthpiece of the instrument held against them. By this means, the opening of the lips into the mouthpiece is constantly reduced, as the tones rise higher, and is constantly increased, as the tones become lower. In the latter case the mouthpiece presses less firmly against the lips, giving them more opportunity to vibrate, and, consequently, forcing the breath through a larger opening.

In adjusting the instrument, it should be placed at the exact centre of the lips, which should be so drawn over the teeth as to produce the effect of smiling. In playing, it is necessary frequently to breathe from the corners of the mouth, so as not to interrupt the music any longer than possible. After same little experience in the practical performance, the student will have learned how, and at what points, to take a new breath. It is well to exercise the lungs and diaphragm, according to some recognized system, in order to enable the holding of the breath through as long an interval as possible. Having thus strengthened the breathing apparatus, it is not necessary to take new breaths until the completion of a phrase, however extended it may be.

One vice against which the student should be carefully warned is the habit of "breathing from the stomach"; exerting effort from a point below the diaphragm. This spoils good performance. Its cause is the attempt to blow too hard.

ARTICULATION OR TONGUEING.—After the position of the lips and the manipulation of the instrument have been thoroughly mastered, it is in order for the student to proceed to the study of the method for separating the notes. Were the cornet an instrument like the organ, or even the flute or clarinet, the separation of the notes would be a matter simply of manipulating a key or valve, alternately opening and closing a passage, for the breath. With all brass instruments, however, the separation of notes must be otherwise attained, since, even with the use of the valves, the tones would be slurred into one another, with a sustained *portamento* or *glissando* effect. Although this very movement is frequently used in cornet music, and is the rule in playing *slurred* and *legato* passages, the separation of the notes for ordinary music is achieved by what is known as "articulation" or "tongueing."

For ordinary performance the necessary effect of separating the notes is obtained by moving the tongue, as though to pronounce the syllable, *tu* (as in "tub"), or, as in the act of expelling a straw from between the lips. The letter, *t*, gives a short and sharp division to the sound produced by the instrument, while the letter, *u*, has the effect of drawing the
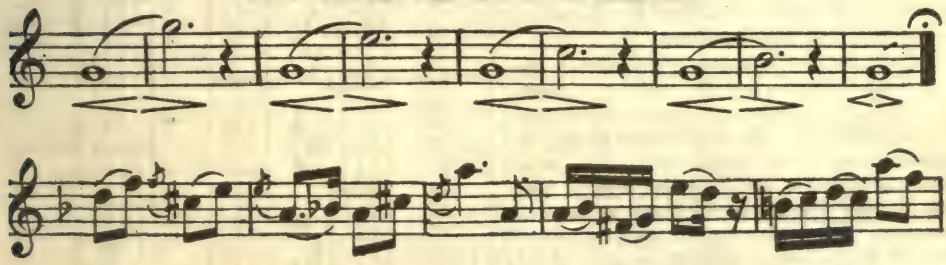
tongue forward, so as to touch the lips lightly. As if in audibly articulating this syllable, the tongue is then drawn back quickly; releasing the breath confined in the mouth by this valve-like movement, and allowing it to pass through the lips into the mouthpiece. With extra rapid passages, the syllable, *du,* (as in "dug"), is used instead of *tu,* on account of the fact that it can be more speedily given. In learning and producing correct articulation, the student must bear in mind that it is very nearly the most important element in correct performance on his instrument. In fact, as has been well said by several authorities, "correct tongueing is as important to the cornet as correct bowing is to the violin."

For obtaining certain effects of accent, etc., cornet authorities discriminate at least three kinds of tongueing. These are: (1) the mute articulation of the syllable, *tu,* as just explained; (2) the mute articulation of *tu,* followed by *ku*—thus, *tu, ku;* (3) by combining the notes into groups of three, as *tu, tu, ku.* These three are called, respectively, single, double, and triple tongueing; or the two latter are known as double and triple *staccato.* Either one of the three may be used in rendering *staccato* passages, according to taste. The first and second, however, are generally used with passages in even measures, and the third, with triplets, in 3/8 time, etc.

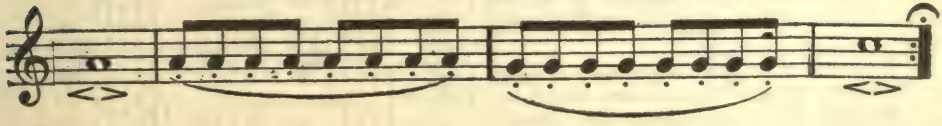
SLURRED PASSAGES.—As previously stated, *legato* passages and slurred notes are run together, without separation by tongueing of any kind. This movement produces a pleasing variation, but would hardly be acceptable for all music. The same remark applies to the special form of slurring, known to cornet players as the *portamento,* which indicates properly such a slurring together of two sounds, as is defined as "a slurred interval." In playing the *portamento,* a *crescendo* or *diminuendo* is most often used, or, in case of long notes, an alternating rise and fall in the volume of the sound. Another form of *portamento,* which should be used with particular care by beginners, consists simply in repeating the first of the two notes as a grace note, and slurring it into that following.

DEMI-LEGATO OR PORTATO.—One form of embellishment common in music for the cornet is the so-called *demi-legato,* written as a series of *staccato* notes joined by a *slur* or *ligature.* The method of rendering is known as *portato,* and is executed by separating the sounds by *very soft strokes* of the tongue, as if in pronouncing the syllable, *du.* The effect of making *soft strokes* with the tongue is to combine the proper separation, belonging to *staccato* measures, with the slurring effect. The notes are somewhat more definite than in either *legato* or *portamento,* but not so clear and marked as in ordinary *staccato.* The student should be careful to thoroughly understand the ordinary tongueing, particularly of the *staccato* passages, before attempting to practice *portato,* or,

TWO EXAMPLES OF *PORTAMENTO*



EXAMPLE OF *PORTATO* PASSAGE
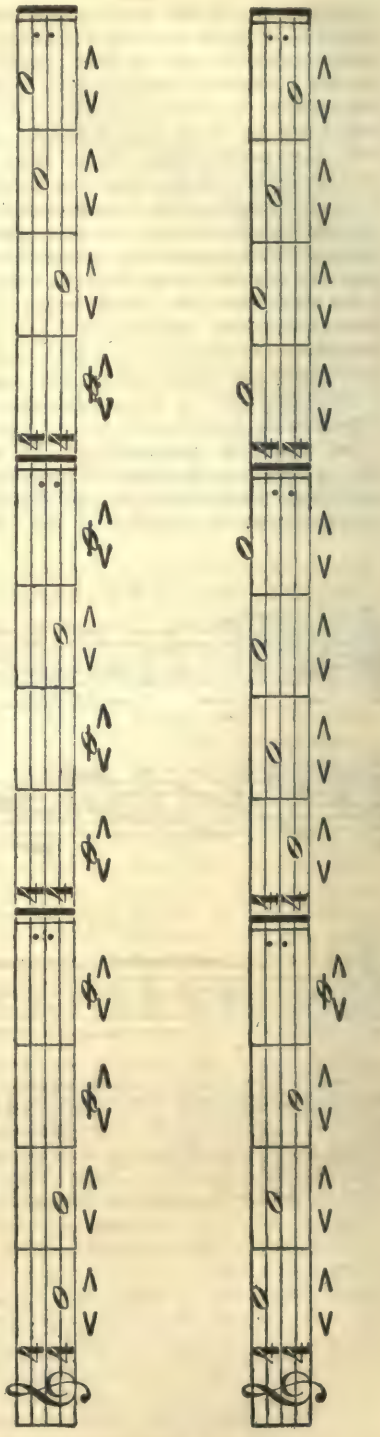


otherwise, "tongueing-in." Until he has thoroughly confirmed the habit of properly articulating ordinary cornet music, the practicing of *portato* is very liable to weaken the stroke of the tongue.

RULES FOR PRACTICING.—In order to strengthen the lips, and to give them the degree of stability required for the proper performance on the cornet, it is desirable to practice slurred measures on the lower notes. The lower notes are to be particularly recommended for this kind of measure, because, as already stated, the practice obtained is valuable in every respect, but does not involve the uncomfortable blowing-out that is always liable to follow protracted practice of the higher notes. Indeed, it is one of the greatest sources of discouragement to the ambitious beginner that he will occasionally find himself unable to continue practice. However, if he will faithfully bear in mind this rule regarding the necessary saving of his lips, he will find that his mastery of the instrument proceeds quite as rapidly—if not more so—than by constantly attempting the highest notes. Another useful thing is to remember that practice had best begin slowly, and be continued slowly, in order to obtain full and well-defined tone production. It may seem to the beginner that slow practicing is altogether too rudimentary, and that the end of playing rapidly should be attained as soon as possible. Let him understand, however, that it is far more difficult to play slowly on the cornet than to play rapidly, and that the man who can render passages slowly and distinctly is certain to be a more effective player of more rapid measures.

TUNING THE CORNET.—Each valve of the cornet has a tuning slide attached, and this is to be used in all keys except B♭. When the A slide is used the 1st and 3d valves must be drawn sufficiently to preserve the proportionate tubing lengths—the 1st being drawn ⅜ inch and the 3d an inch at least. To test the tuning, sound E as an open tone, then with the 1st and 2d valves down; moving the slide until perfect unison is obtained. The 3d valve is tuned by sounding G open, and then with the 1st and 3d valves; moving the slide until unison is obtained. The cornet in B♭ is best for keys in flats and the cornet in A for keys in sharps. The keynote of the B♭ cornet is one tone above the piano or violin key.

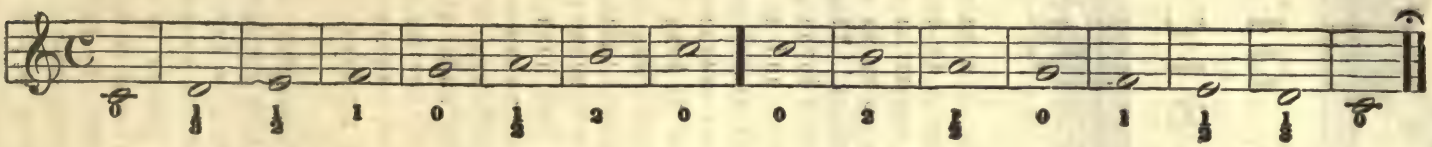
EXERCISES ON TONE-PRODUCTION AND DRAWING-OUT
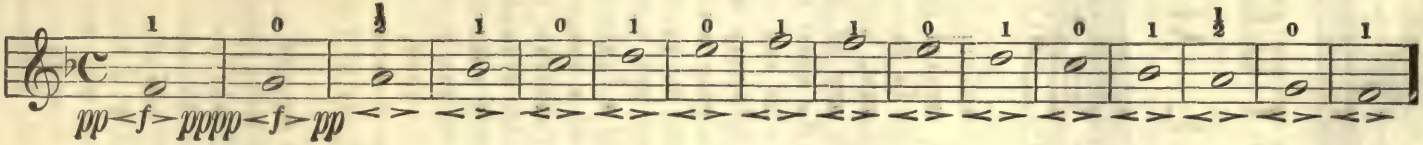


MAJOR SCALES FOR THE CORNET, WITH FINGERING

The Scales of C and F run through one octave only, while G includes two octaves. The first two, or one octave of the third, form the best practice at the start

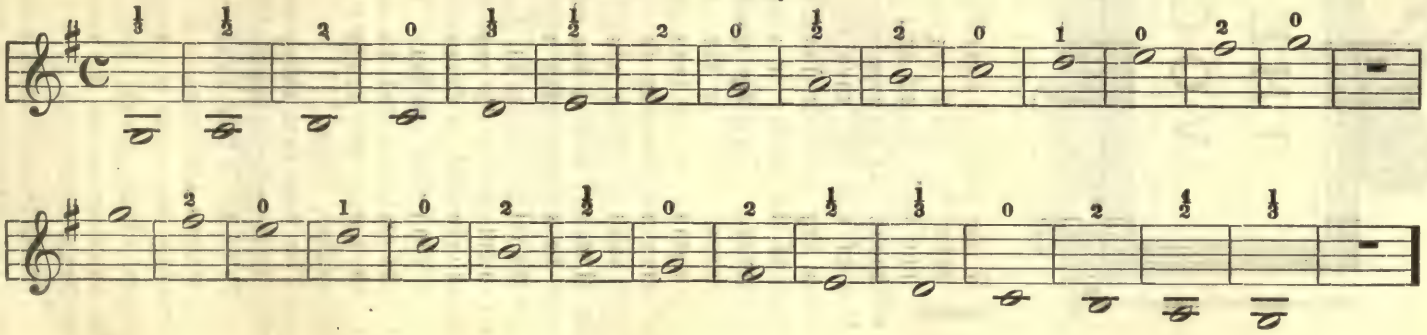
SCALE OF C MAJOR



SCALE OF F MAJOR



SCALE OF G MAJOR



THE STUDY OF VOCAL MUSIC

IN the work of learning and practicing singing, it is necessary to consider the vocal organs as a musical instrument, to be played upon and to be tuned and cared for in the same manner as any other instrument. It is even more important, with the voice, to observe every law of use and care than with any of the others. This is true because any incorrect handling of the vocal apparatus involves, not only a loss of the ability to sing, but also loss of health and numerous other disasters. Correctly speaking, it is very difficult, if not impossible, for a person to master the art of singing without an instructor. He may understand all the laws governing the production of tone, and carefully observe all the rules for breathing and vocalization; but, except in very rare cases, or with what is called a "naturally placed voice," the rule to be observed is that the services of a competent instructor should invariably be sought, after the first rudiments have been understood. If a person takes lessons on a violin, for example, and can not master the instrument sufficiently well to become a finished performer, it makes comparatively little difference after he has once come under the instruction of a competent teacher. With the voice, however, any incorrect method taught and practiced, for a longer or shorter period, frequently does irreparable harm, and renders the efforts of the best teachers almost, if not altogether, futile.

The very first thing that the student must thoroughly understand is that it is quite as natural for a human being to sing correctly and effectively as for a bird to sing, or for other animals to give forth their peculiar sounds and cries. It appears, therefore, that the correct method of training the voice is, simply and logically, that method which develops nature along natural lines. Singing is not an art that is to be acquired by learning to use the organs in a way not intended by nature: it is in no sense analogous to the performances of acrobats and contortionists.

Some people might suppose that, because singing is, rationally speaking, the natural use of natural organs in a natural way, therefore, any

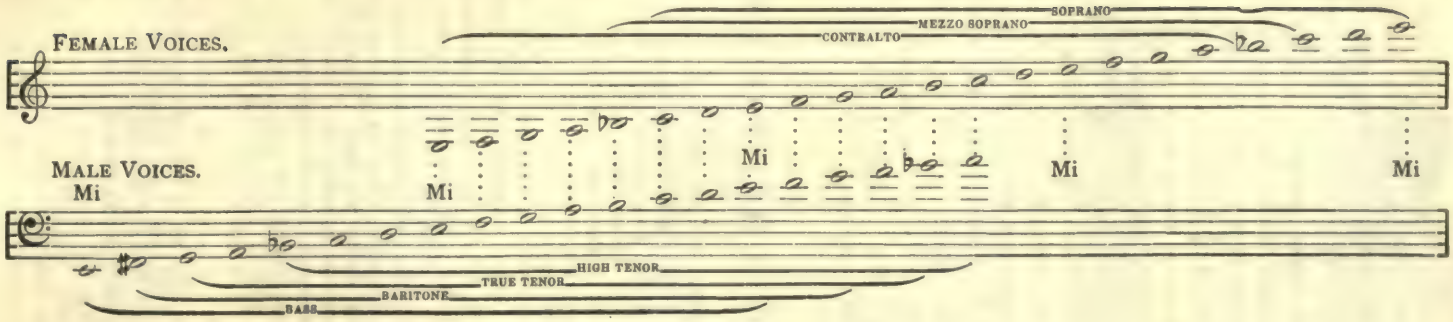
one can sing without need of instruction. If, however, he will consider a few facts of life outside of this department, he will speedily recognize that the human being is peculiar in nature, in the fact that he must laboriously learn the correct use of nearly every organ and faculty he possesses. He utterly lacks the instincts of the lower animals, which, while making them virtually animated machines, lead them unerringly to the proper use of all their faculties. The human being must be taught to use his brain, his muscles, and his senses, and this education is necessary in every instance, to prevent the injuries arising from both misuse and abuse. In some departments of activity he soon discovers that, with the best eyes and the best ears in the world, he can neither see readily nor hear rightly until he has been accurately instructed in the proper methods of use. If, without proper education, he attempts to use his brain in any but ordinary work, it soon becomes apparent that he is competing hopelessly with trained minds, and is able to accomplish very little of what he laboriously and unsuccessfully strives after. In all departments of life, however, the word "education" is properly to be understood in its original Latin signification of a "leading-forth," which is to say, the development of natural faculties from within, outward.

THE PROPER USE OF THE VOICE
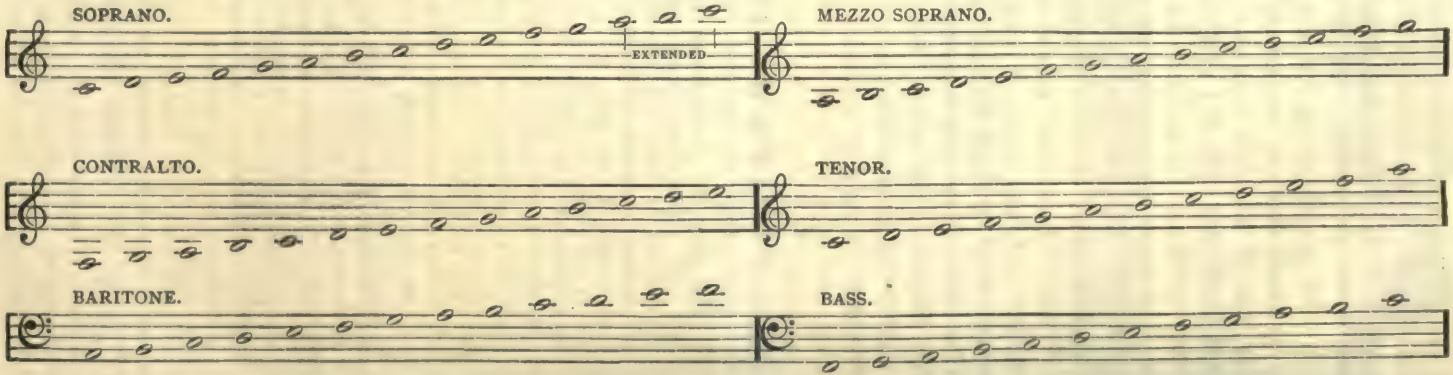
FROM what has just been stated the student will readily understand that the correct method of using the voice involves, in learning, no strain or unnatural effort of any kind. To be sure, the protracted use of the voice, in singing, speaking or reading aloud, will produce weariness of the muscles of articulation. But, if this weariness is followed by soreness of the throat, severe hoarseness, or any other distinctly pathological condition, it is the best evidence in the world that the voice has been incorrectly used, and that it is time to seriously consider a rational and natural method of training. At this point it is necessary to observe that there are certain persons professing to teach singing and the use of the voice, who will tell the student that a sore and rasped throat is necessary to attaining the strength that is needed, or that the straining of the vocal organs is only a step in the process of developing their powers. Such persons should always be avoided. Many good voices have been ruined by their so-called "methods."

RUDIMENTS OF CORRECT SINGING.—There are three things to be considered in learning and practicing singing: they are breathing, articulation, and tone-production. In studying breathing and articulation, we are merely tuning the musical instrument to produce the tones that should naturally result with proper use. This means that correct tone-production is simply the natural consequence of correctly using properly trained and tuned vocal organs. We must not forget, however, that the student of singing is, by no manner of means, able to judge when his vocal organs are sufficiently developed to produce correct tones, nor whether, in the production of tones, he is merely following a vicious habit or actually doing his best. While, however, it may be possible that, with a correct understanding of all that is involved in learning singing, one can progress considerably toward mastery of the art, at the point of producing correct tones and using his voice for actual work, he requires the services of a competent teacher, whose trained ear can detect any deficiencies and indicate precisely what is required. This warning should convince the student that he must proceed with the greatest care, and with constant attention to even the minutest detail. Tone-production is, of course, the most important ele-

DIAGRAM OF THE COMPASS OF THE HUMAN VOICE



AVAILABLE COMPASS OF VOICES



The Tenor is here written an octave above its comparative pitch.

ment in all vocal training. It is the first thing to be considered, and, perhaps, the last thing to be actually mastered.

According to the Italian method, which consists simply in training natural faculties naturally and normally, the interior of the head, including the cavities behind the nose and mouth, is to be considered as a sounding-board. This does not mean that tones are to be produced by forcing the breath through the nose or throat, but that these cavities act like the boxes of the violin and guitar in supplying the element of strength and power to the sounds of the vibrating strings. With a stringed instrument, the sound—which is to say the point of excitation of the string—is always at one precise place on the instrument. The human voice differs, however, from every instrument in the fact that tones, resonating more or less through nature's sounding-board, can be produced at a large number of points in the throat, head, chest, etc. This is the very particular in which singing, or correct training of the vocal instrument, is found to differ from bungling and injurious tone-production, in precisely the same manner that the strummings and scrapings of the amateur differ from the finished performances of the trained guitarist or violinist. The first thing, therefore, that the student should understand is that the tones must be focused—which is to say, directed, deliberately and intelligently—upon a certain definite point. That point is the centre of the dome or arch formed by the roof of the mouth, or, more correctly, the palate.

DIAPHRAGMATIC BREATHING.—Knowing, now, exactly at what point the sound must strike the resonant sounding-board, we may proceed to the second point, which is to the art of singing precisely what correct bowing is to violin playing; in other words, we are to learn now whence comes the sound that is focused in the dome of the mouth. A distinguished singer has given us a suggestive sentence for guidance in this particular. She says: "To sing correctly you must pick up your notes from the floor." This means that the breath, which is to produce the sound, must be constantly and deliberately expelled from the lowest portion of the breathing apparatus—which is to say, from the diaphragm. This muscle, as all know, is situated in the chest and, in certain senses, serves as a partition to separate the lungs from the other organs of the body. It performs, also, a very important function in the act of breathing; since, to express it briefly, it acts upon the lungs in about the same fashion as the hand acts upon the rubber bulb of an atomizer, forcing the air from it and, on withdrawal of the pressure, permitting the air to rush into it again. To breathe correctly the muscle known as the diaphragm must be deliberately strengthened by proper exercise and constant service in the act of expelling the breath, until its correct use becomes a habit.

In singing, therefore, while it is eminently correct to say that the "singer has no throat or chest"—which is to say that these parts have nothing to do with tone-

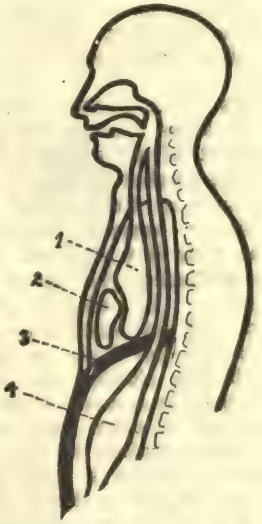


Diagram showing position of the diaphragm in the human body: the lungs, 1; the heart, 2; the diaphragm, 3; the stomach, 4.

production—every sound produced by the vocal cords and focused against the palate must be formed by a column of air, expelled by a deliberate dynamic action of the diaphragm. In the earliest efforts to properly direct sounds the student can do no better than place his hand over the diaphragm, which is situated just above the point where the ribs join to the breast-bone at the front of the chest. It is not necessary that he exercise force with his hand, as though he were a bellows or a rubber ball filled with air—although this action might assist in enforcing the true use of his breathing and vocalizing apparatus—but, in the early stages of his study, he must be careful

that every impulse, short or long, proceed from a distinct effort of the diaphragmatic muscle.

Elements of Tone-Production.—We have learned thus far that each sound in singing must proceed from the lowest point of the breathing apparatus to the highest point of the mouth. In singing, therefore, the student must direct his attention to those two points, with a view to guiding the tone pure, straight, and full, upon the focal point. In doing this he must not allow the throat to act, except as a wind passage; he must not restrict its action consciously, or allow it to be restricted unconsciously. The sound-producing breath is like an arrow shot from the bowstring, which is the diaphragm, to the roof of the mouth, which is the target. Nothing must act midway, either to deflect or check the shaft.

Exercises in Articulation. — Another element of weakness lies in the insufficient development of the organs of articulation. A large number of persons speak indistinctly—"chew up their words" as the saying is — simply because, in articulation, they use their lips no more than is necessary to producing the barest rudiment of a sound. In order to produce clear, distinct, and full enunciation, it is necessary that the lips have as large a part as possible in shaping the sounds. This involves that, in training himself for the profession of a singer, the student should take daily exercises in the use of the lips, standing before a looking-glass and making each sound as clearly as possible; using the lips to perform as large a part as they can in the shaping of each sound. Even if such action appear to be exaggerated, causing him to make a succession of ugly faces and grimaces, it is better so than that the lips should not act to the fullest possible extent in the production of words.

To be sure, this activity of the lips is hardly required in ordinary conversation, and may be unnecessary in a good deal of public speaking, but in singing it is essential that the lips be so strengthened by constant exercise; so completely under the control of the will, that they can perform the largest possible part in articulation, thus relieving the throat of much of the strain which some people throw upon it in talking and very many in singing. Strengthening the lips and increasing their activity is the all essential element in producing a clear and distinct enunciation. The action of the tongue must also be perfect and complete in every instance, although its movements need not be exaggerated, as those of the lips must often appear to be. In the effort to strengthen the lips, and secure their activity to as great an extent as possible in articulation, some teachers recommend that the beginner in practicing lip exercises press his hands against his cheeks, so as to render the muscular effort in moving the lips as strong as possible; thus helping to exercise them, and, at the same time, confirming the habit of activity in his mind.

It is customary, also, to give the student exercises in running through the vowels, which are pronounced, however, as in the continental languages, Italian, French, etc.; thus, *ah, ay, ee, oh, oo.* These vowels sounds are most effectively practiced when they follow the labial or lingual consonants, such as *d, t, n, m, b, p;* thus, *tah, tay, tee, toh, too.* In each case the lips must form as large a part as possible—even an exaggerated part—in the production of both vowel and consonant sounds. Thus, as we have already stated, the greater part of articulation is performed by the lips and tongue, leaving the throat free to serve as a mere conductor of the breath and the chest as the seat of the original dynamic impulse of the voice.

Exercises for the Diaphragm.—For the proper strengthening of the diaphragm certain exercises are given by instructors in correct breathing and physical culture. Their object in every case is to increase the activity of this organ, and to give it greater strength. It must not be forgotten, however, that in the exercise of this muscle, as in the exercise of other muscles of the body, it is not necessary to subject it to any unnatural strains, or to compel it to perform any acts that are outside of the function ordained by nature. Its function, as we have already seen, is most largely to relax when breath is taken into the lungs, and to contract to expel it again, as soon as the natural ends have been served. To strengthen its action, therefore, one of the most beneficial courses is to stand upright with the shoulders thrown back; to take a deep, long breath through the nostrils; to hold it for a certain period, say while you count twenty, and to expel it again through the nostrils by the conscious effort of the diaphragm. Conscious action of the diaphragm may be secured and increased by placing the hands on the lower portion of the thorax

on either side, just opposite to the breast-bone. This secures the focusing of the thought at the correct point. Another of the exercises that is sometimes recommended is what is known as "the panting exercise." This consists in taking short deep breaths through the nostrils and expelling them by distinct actions of the diaphragm.

Perhaps the exercise to be most strongly recommended to the student of singing is as follows: Take a deep breath through the nostrils, and, in expelling it, under diaphragmatic impulse, vocalize some vowel sound—such, for example, as *oh* or *oo*—prolonging it sufficiently to nearly exhaust the air in the lungs, while at the same time keeping the tone as near as possible on the same pitch and note. As soon as it becomes impossible to maintain the sound at a given pitch let it die away slowly, and stop before the breath is entirely exhausted. Apart from enabling one to learn sustaining the note, this exercise is of the greatest benefit in strengthening the diaphragm.

FORMING THE TONES.—After the student has thoroughly identified the action of the diaphragm, and has learned to breathe correctly, which is to say with the complete action of the diaphragm in every case, he may proceed to attempt the use of his voice, always remembering that sounds are to be focused in the dome of the mouth, and that words are to be formed with as great activity as possible of the lips in every case. We have previously used the simile of an arrow shot from a bow at a target, and this figure may further be carried out by saying that, in both cases it is necessary to deliberately aim at the point we wish to strike. Of course, the student can not see the interior of his own head, but he can direct the impulses to the point of resonance by fixing his attention upon it. In order to thoroughly identify the focal point, it is desirable that he vocalize certain notes with closed lips, thus producing sounds resembling *m* or *n* long continued. By the making of these sounds with diaphragmatic impulses, at the same time fixing the thought upon the dome of the mouth, the tone may be properly placed. In this work, however, the assistance of a teacher is most desirable, if not entirely necessary.

In the production of tones the student will discover that it is far easier to vocalize—which is to say, to produce the simple sounds—than it is to sing, or to utter articulate words, while giving forth musical sounds. This is precisely where the singer requires the ability to control the action of his lips, and also where it is positively essential that the lips be sufficiently strengthened by proper exercise to fully and perfectly perform their functions.

While the student can not tell whether he is producing a correct tone or not, being unable to hear his own voice, so far as the tones or qualities are concerned,



The pharynx laid open, showing the vocal cords. These are membraneous muscles on either side of the air passage; their function being to modify the tone produced, by contracting or relaxing, thus reducing or enlarging the opening, like a reed in wind instruments

he can very readily detect any poor tone production in the fact that the inevitable result is tickling and rasping in the throat, such as will make it difficult or impossible to continue. It is not necessary, however, nor is it in any sense desirable, to continue the vocal experiment sufficiently long to find out whether the throat or other parts show signs of injury. The slightest sign of such symptoms should convince the student that he is on the wrong track; either his breathing is not sufficiently strong;

his enunciation is not sufficiently distinct, or, most probable of all, his sound-focusing is faulty. He must carefully pick his way, paying attention to all these points; giving each note with a strong impulse of the diaphragm; carefully keeping his mind upon the diaphragm and the highest point of his palate, and using his lips in every case for shaping articulate sound. At the slightest sound of weariness in the throat or mouth he should carefully reconsider the sound, as it is more than probable that it is wrongly produced.

Results of Proper Training.—If a voice is properly trained according to the natural method of tone-production, and the student continues to practice properly, so as to strengthen all organs which require strength, he may continue singing indefinitely without weariness, or producing tickling or irritation in his throat or mouth, and feeling no more than such general lassitude as follows any continued physical exertion. Furthermore, a voice properly trained should last for years, even to old age, and with no other impairment of strength and quality than comes from the inevitable general debility of advancing years.

The Need of Good Instruction.—While it is very probable that few, if any, students can train themselves to sing properly, without the assistance of a competent teacher, it is considerably better for them to try to learn singing by themselves, rigidly observing every direction set forth in this article —not attempting the second thing until the first thing is thoroughly mastered—than to trust themselves in the hands of any of that very large, ignorant, and vicious element that thrives by charging exorbitant fees to ruin voices by teaching unnatural methods.

Compass of Human Voices.—As shown by the annexed diagrams, the ordinary compass of the human voice is between the F sharp below the bass clef and the E above the treble; the lowest note being in the bass compass and the highest in an exceptionally good soprano. The compass of the various voices, as indicated in these diagrams, is, of course, only approximate, since individual voices differ immensely in both range and power—no two having exactly the same compass, even though falling under the same general category. One of the most necessary things, therefore, for the singer to learn is exactly the range of his own voice, which will enable him to judge the key in which a piece can best be rendered. This means that it is not possible to take a piece of music written for a bass voice, for example, and raise it an octave, in order that it may be sung as a soprano solo. On account of limited range and other special properties of voices, it is generally necessary that the key be transposed, as well as the clef. It is particularly desirable, especially for beginners and students, that, except in carefully selected practice pieces, they should not attempt to sing in a key containing tones difficult of production.

Basis of Classification.—The classification of voices is based, not only upon their compass or range of effective tones, but upon the amount of weight and body with which these tones are produced. Thus, the bass has, characteristically, a greater volume of sound than the baritone: it, in turn, is less light and fine than the tenor. The same distinctions hold, also, for female voices.

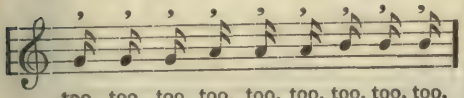
Position in Practice.—In practicing singing and the essential breathing exercises, it will be found that the standing position is calculated to produce the most satisfactory results. In this position, the action of the lungs and diaphragm is free and unconfined for the production of perfect tones.

Practice on Tones.—When the student has once arrived at a definite knowledge of the proper compass of his voice, the best exercise in tone-production is running the scales, although, at the beginning, he should carefully avoid attempting any tone that seems difficult to produce, whether it be too high or too low. By rigidly observing this rule, he may readily sing the scales and exercises after a few weeks' proper practice. Where the organs have been sufficiently strengthened by exercise, and the production of the easy tones is perfected, it will be time to consider whether the tones, hitherto found difficult, may be acquired by practice. As a general rule, nature decides this question. For, with the proper development of the vocal apparatus, some tones, difficult at first, will be readily produced or easy to attain. Others, however, must always continue to be outside the register even of a cultivated voice, which can not produce a semitone above or below.

In practicing singing such simple exercises as are shown herewith are usually given to the student. He must sing each tone with the word "too," and must be careful to pronounce it fully and properly; at the same time sending the voice to the highest point in the head, as already de-

scribed—the test of correctness being that he can feel vibration at that point in every separate case. In the earliest exercises given to the vocal student, the end of correct

EXERCISE IN ARTICULATION

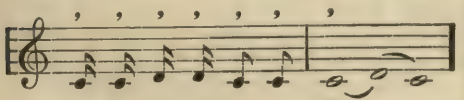


breathing is assured by taking a fresh breath at the end of every note. The place for taking the breath is indicated in primary exercises by a mark resembling a comma (,) written immediately above the staff.

Rules for Using the Breath.—The act of breathing at the end of each note, as in the subjoined exercises, not only involves correct action of the diaphragm, but also attains another desirable object—the ability to properly sustain the note for its full value in time. Such exercises should be sounded from the lowest to the highest tone of the scale which the student finds in his available compass, and must be persistently practiced until the ability to sustain notes to their full value is fully acquired.

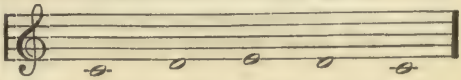
The next step in the practicing of singing is to master the *slur*, which must be carefully studied. In general, the production of *slurred* or *legato* movements in singing consists in running through the entire range of notes indicated in the written scale on a single inspiration. If the lungs are properly filled with air, the first tone should be attacked boldly and sounded with clear precision; the breath being held, meantime, and sent higher in the head for each succeeding note, until the movement is finished. This rule applies, not only in the production of two tones immediately following in the scale, or *seconds*, but in

ARTICULATION WITH THE SLUR

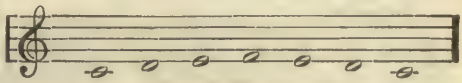


singing runs of *thirds, fourths, fifths*, etc., until the entire gamut may be given at a single breath. In order to attain the most satisfactory results in this particular, it is desirable to practice scales of whole or half notes, instead of notes of smaller value, since by this means the important ends of strengthening the diaphragm and enabling the better sustaining of notes are alike attained. It is, therefore, essential that exercises in *thirds, fourths, fifths*, etc., should not be attempted until the student has mastered the exercises on *seconds*, as given above. He should first practice to acquire the ability to sustain *several notes on one tone*, without fresh inspiration; then, to produce two tones on one breath,

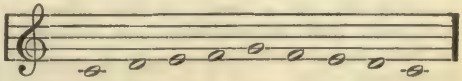
EXERCISE IN THIRDS



EXERCISE IN FOURTHS



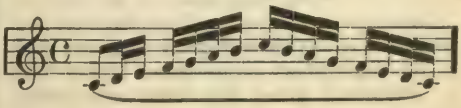
EXERCISE IN FIFTHS



EXERCISE IN SIXTHS



EXERCISE IN THE SCALE



and, finally, to connect any possible number, as already explained.

Articulation.—After thoroughly mastering these exercises in tone-production and the sustaining of notes, the important matter of articulation is introduced. Instead of practicing the successive tones with the syllable "too," the syllable "toe" is to be used. This syllable is the open tone, and is pronounced so that the *o* is prominent, being given with a quick dropping of the lower jaw. The student must practice all the first exercises with this syllable before advancing.

In practicing the scales, the student must
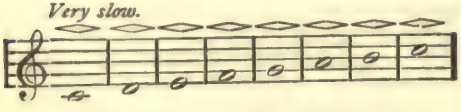
work patiently and persistently, without straining or undue effort, so as to run the gamut once, and then twice, according to his breathing power, on a single breath.

Shading and Drawing-Out.—When he has succeeded in singing the scales two or three times with a single breath, he will have obtained excellent results. After having practiced the scales, so as to obtain perfect uniformity in the notes, the next step is to practice shading or the singing of notes loud or soft, and dropping from loud to soft, and rising from soft to loud, on the same note. This is called "drawing-out" tones, and is one of the points in vocal music that should be practiced with the greatest care. As in the violin and other musical instruments, the

EXERCISE IN DRAWING-OUT

A breath for each note.

Very slow.



drawing-out of a note, or the alternate *crescendo* and *decrescendo,* are indicated by two angles with their points in opposite directions.

Only when the student is sufficiently master of his voice to sing through the scale on a single breath is he in position to attempt drawing-out. In studying shading, it is desirable to begin the exercises with the whole note, taking a breath for each one, and carefully practicing the alternate increase and decrease as indicated in the following example.

Practicing Octaves.—Exercises in octaves, or in transitions from any one note to its counterpart eight tones above, may be attempted after the tones are clearly discriminated in the student's mind, and their production, as degrees of the scale, has been perfected. In singing octaves, especial care should be exercised, since the tones are very liable to be run together, and sung as a unison, instead of as eighths.

EXERCISE IN OCTAVES



While they must be connected, they must not be dragged together. It is not altogether the most advantageous habit to run the scale mentally from the lowest to the highest tone, in the production of eighths, but this may be done at the start in order to ensure accuracy. Altogether the best method of practicing octaves is to return to the lower tone, after sounding the *eighth,* and taking particular care, meantime, to keep both tones high in the head.

Observations on Practice.—The necessary practice involved in rendering singing, or any other form of music, may seem laborious, and, at times, somewhat more than is positively necessary. But the beginner must understand that all these matters have been carefully calculated, with a view of giving him facility in the very points that are most essential to good execution. As has already been explained, it is necessary that the breathing apparatus be properly strengthened, and that the production of tones be clear, pure, and accurate. If this is not carefully remembered, and the directions given by the teacher are not conscientiously observed, it will inevitably follow, not only that one can not learn to sing properly, but also, that in attempting to sing at all, he may do himself serious injury.

INSTRUMENTAL SIGHT-READING SELF-TAUGHT

THE term, "sight-reading," may mean either of two things: (1) the ability to render any piece on a musical instrument from printed or written notes, without previous practice; (2) the ability to read written notes, with such complete appreciation of the tones indicated on the staff in each case, as to enable the voice to reproduce them apart from instrumental guidance or accompaniment. As may be understood, therefore, the two arts are really distinct; the latter requiring by far the greater training in musical technicalities. Nevertheless, both require patient and careful study, and considerable exercise of memory and discrimination.

SIGHT-READING FOR INSTRUMENTAL MUSIC

IN order to acquire the desirable ability to read at sight music for any instrument, three things are essential. The first is that the student should be so far master of his instrument that he can turn, with the least possible hesitation, to the key, fret, touch or valve that represents any desired tone, or semitone; the second, that, by virtue of constant practice, he is perfectly familiar with the notation of written musical scores, and can readily name any line or space in either clef; the third, that, by virtue of the constant use of written notes in practicing, his mind readily co-ordinates the tone indicated by a note on a line or space with the fret or key producing it on his instrument.

In the fewest words, the whole matter of instrumental sight-reading consists in constant, careful, and thoughtful practice at playing from written notes—using the ear and the memory for melody or tone-sequence as seldom as possible, if at all. By this means one is enabled not merely to learn single pieces or selections, but also to train the eye to rapidly co-ordinate the written note with the key producing its tone, and to enable the fingers to take the proper position for striking at the moment the mind forms its concept. As with all other mental processes, the essential act of learning to read by note is unconscious; following simply as the sense and facility at understanding and acting increase by constant practice.

In practicing, however, it is imperative that, no matter how well a piece may be known and mastered, it be always played from notes—the eye being compelled to observe each separate element written upon the staff, and the fingers being restrained from acting until the mind has followed the eye. Thus, the habit of closely observing notes and of compelling the fingers to perform the acts they indicate is confirmed; making the concrete act more and more automatic and precise, until familiarity with both notes and instrument is complete. The process is undoubtedly tedious at first, and the performance slow, but the student will find that his progress into rapid reading and playing is amazingly easy.

At this point it seems desirable to again emphasize the fact that study of music, or

any other subject, should never be a tiring or agonizing process. The brain, like the digestive organs, the heart, lungs, etc., is a machine that works, automatically, unconsciously, and regularly, according to natural laws. There is no need or use, therefore, to "cudgel" it. We have only to feed ideas to it, just as we feed nourishing substances to the stomach, allowing it to act upon them in its own way and in its own time. By thus following the rules for study and the presentation of ideas to the senses, without worrying or striving, the understanding and familiarity come all of a sudden, when we are not expecting it: the brain has worked upon and assimilated the idea. Therefore, we can only say to the student; "Practice, practice, practice, according to the simple rules given you, and some morning you will wake up and find yourself perfect—in your art."

The following list of directions is given in several works of instruction in instrumental music, and is included here for the sake of giving greater clearness to what has already been said:

(1) "The student can not turn his attention to playing at sight, until he has gone entirely beyond the rudiments, and has attained a certain degree of mechanical skill.

(2) "Then, let him choose, in beginning, such works as he can fully master, and which, in special reference to mechanism, offer but few difficulties.

(3) "The main rule in practicing reading is to play one portion of the piece through from beginning to end, without allowing one's self to be stopped by any difficulty. Although many imperfect chords and indistinct passages may occur, and although he may leave out many notes, yet the player must not be misguided by them and stop to correct himself, but play on uninterruptedly and endeavor to give such a rendering as may be, in the main, a faithful picture of the whole work.

(4) "He must choose a *tempo*, or rate of playing, that will make the execution somewhat easy, and yet one not too far removed from that marked at the beginning of the piece.

(5) "He should play a piece through in this way a few times only at the utmost, and then change it for another.

(6) "He will, then, by degrees, acquire facility at quickly conceiving a composition, and learning to read quite readily, even intricate chords and passages. To this end, however, some knowledge of harmony is in a high degree desirable, if not altogether indispensable.

(7) "Playing with others in duets, trios, quartets, arranged for your instrument, as well as with the accompaniment of one or more other instruments, lends a considerable zest to practice."

VOCAL SIGHT-READING

IN ORDER to master any instrument, or to obtain even a moderate facility in singing, easily the most important thing is to acquire familiarity with the scale or gamut in every key. Taking the natural scale of C *major,* and running the succession of natural tones, either one or two octaves, can train the ear to detect the same proper sequence of tones and semitones in all other *major* scales. It is far better, however, to thoroughly master the theory of the scale, or gamut; remembering that every other key follows the natural, or C, scale, in having a semitone between the third and fourth and between the seventh and eighth degrees in the *major,* and between the second and third and between the seventh and eighth in the *minor.* The scales thoroughly discriminated and mastered, the other intricacies of either instrumental or vocal music are naturally and easily understood.

When the student of vocal music has reached the stage at which correct tone-production is natural and easy, he will find himself greatly assisted by sounding the tones on the piano, or some other carefully tuned instrument, and reproducing them with his voice. In this work, as in all other steps in the process of learning music, it is in every sense desirable to closely follow a written score; thus gradually fixing in the mind the correspondences between the lines and spaces of the staff, in either *clef,* and the tones to be produced by an instrument or by the voice.

In the following pages only the general principles have been explained, in order to give the student the benefit of experience, apart from the technical expressions used by various teachers.

SIGHT-READING FOR VOCAL MUSIC

IN mastering the intricacies of vocal sight-reading, the first step is to obtain perfect familiarity with the so-called natural scale of C *major.* Upon this scale are based all the generalizations to be followed later with other keys. In learning to read vocal music, the student is taught to give the degrees as Do, Re, Mi, Fa, Sol, La, Si, Do, instead of singing, as might be more logical in some ways: C, D, E, F, G, A, B, C. These syllables, furthermore, are pronounced, not as in English, but as in other European languages. Thus: Do (doh), RE (ray), MI (mee), FA (fah), SOL (sole), LA (lah), SI (see)—the syllable, *ah,* being always pronounced broad, as in the English interjection, "Ah!"; and the syllable, *oh,* like the interjection, "Oh!"

The origin of the syllables denoting the several degrees of the scale is a matter of interest. They represent the first syllables of the seven lines of an ancient Latin hymn, which is as follows:

Ut queant laxis.
*Re*sonare fibris,
*Mi*ra gestorum.
*Fa*muli tuorum.
*Sol*ve polluti.
*La*bu reatum,
*Sa*ncte Joannes.

This hymn, according to the crude ideas of mediæval musicians, was sung so that each successive line was rendered on one degree of the scale, from the first to the sixth—which is to say, all the words in the first line were given in the tone of C; all in the second, in the tone of D, etc.

On account of being sung to this "tune," it furnished a ready model of the gamut in six degrees for students of music. Thus, the lines of the hymn, afterward only the first syllables, came to be used as synonyms for the pitches of the successive degrees. Later, when the seventh degree was recognized in music, the first syllable, *sa,* of the seventh line, was added to the other six; but, for the sake of euphony, was changed to *si.* Similarly, *ut* came to be rendered *do* by a large majority of authorities. To the present time, however, the seven degrees of the *natural scale* are designated by French musicians as Ut, Re, Mi, etc., instead of by the letters, C, D, E, etc., as with us.

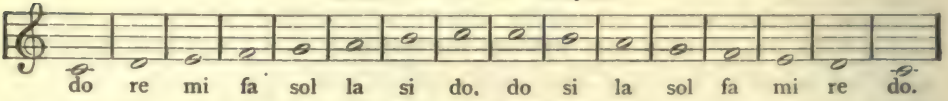
The syllables, therefore, correspond primarily to the degrees of the scale of C *major* and this system is rigidly followed by many masters of vocal music. Others again, for the sake of rendering the study simpler in some particulars, consider that Do may represent the keynote, or first degree, of any *scale,* while Re is the second, Mi the third, etc.

Any one attempting to teach himself to sing by note must begin with constant practice in the scale of C major, running it up and down the gamut by seconds and thirds. Having accustomed himself to readily recognize the degree of the scale indicated in written music, it may be possible for him to more readily begin scales in any key with the syllable indicating its tone on the natural scale. Thus, while the scale of C major begins on Do, that of its relative A minor, begins on La. After a little practice, it is quite as simple to begin the scale in any key with the name of the degree on the scale of C, as to begin it with the syllable Do. In every case, however, a variation occurs when sharps or flats are to be indicated. Whatever may be the vowel used for the natural tone, its sharp is represented by the letter *i* (pronounced as *e* in "me"), and its flat, by the letter *u* (pronounced as in "bud"). Thus Re ♯ is Ri and Re ♭ is Ru.

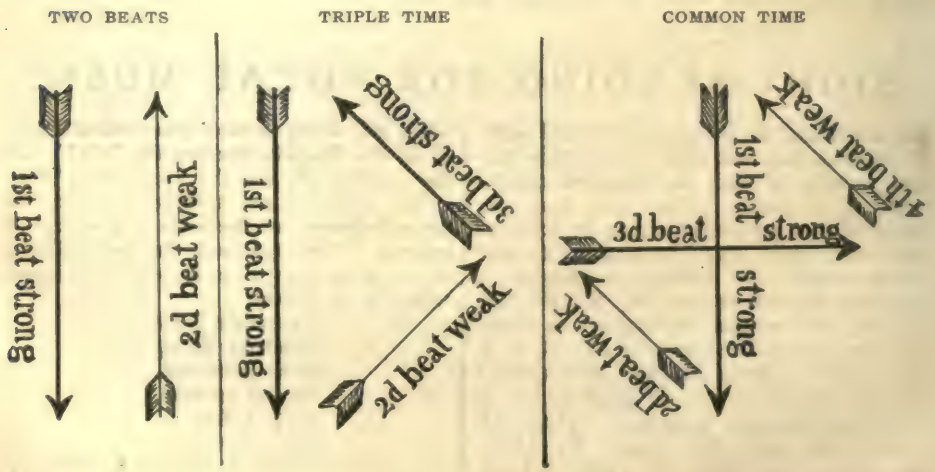
Thus, in running the scale of C by sharps, we have: Di, Ri, Fa, Fi, Sil, Li, Do, Di.

In running it by flats, we have: Si, Ru, Mu, Mi, Sul, Lu, Su, Si.

GAMUT OF C MAJOR



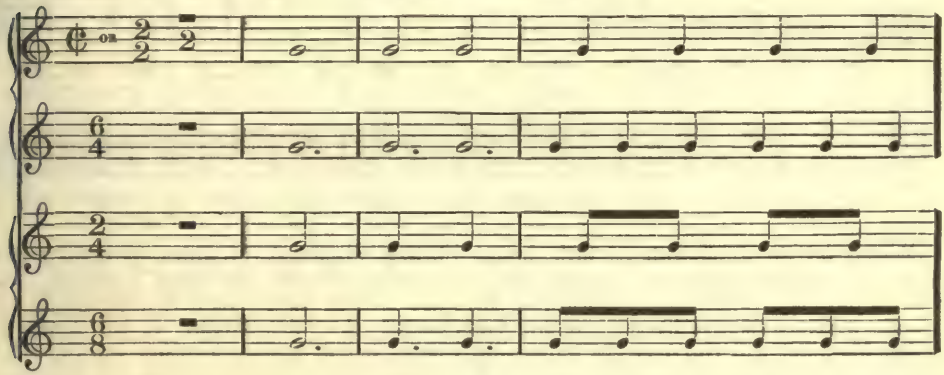
MODE OF BEATING TIME
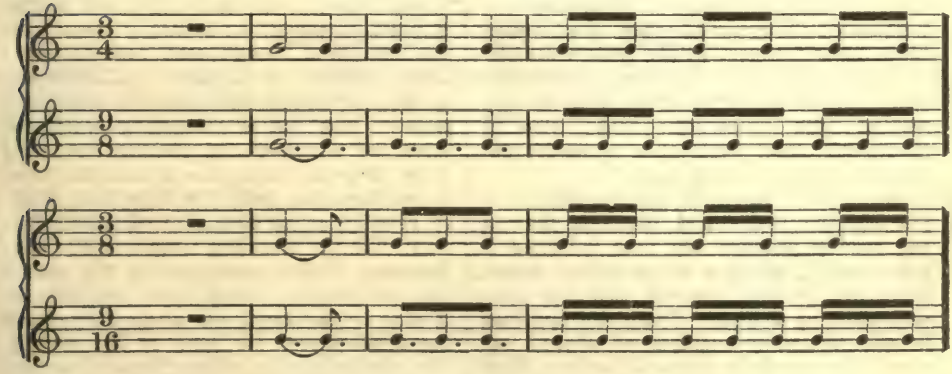


In these sequences it will be noticed that Fa, being the sharp of Mi, which already has the *i*, is substituted for it; and, that Do, being the sharp of Si, also having the *i*, is also retained. In the scale by flats, Si, being the flat of Do is used instead of "Du," and Mi, being the flat of Fa, is used instead of "Fu." Such terminology serves two good ends: (1) it provides that the names of the *natural tones* shall never be varied; (2) it gives the student both visible and audible reminders of the proper intervals of the scale—the semitones being indicated by the sequences, Fa-Fi, Do-Di, Mu-Mi, and Su-Si.

In beginning the study of the scale, the student will find it best to accompany his voice on the piano, or some other instrument with which he is thoroughly familiar; always reading the notes from a written or printed staff, and trusting to memory for nothing except the sounds indicated on the lines and spaces, when the instrument is not used. It is most essential from the start to observe the time indicated at the signature; and, even in singing scales, this rule must be followed strictly, in order to give each note an exactly even value. This means that the student must study sight-reading with the assistance of a metro-

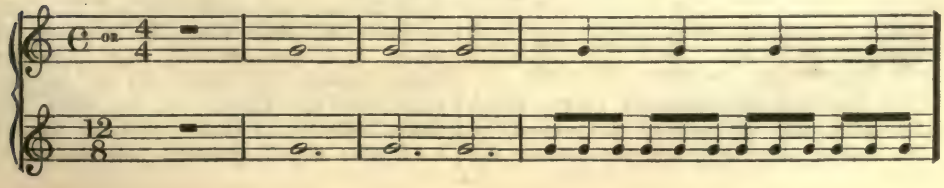
TIMES OF TWO BEATS.



TIMES OF THREE BEATS.



TIMES OF FOUR BEATS.

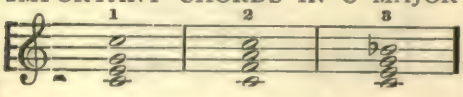


nome, or preferably by beating the time with a baton or ruler, according to the diagram on page 356. The proper number and directions of the beats are indicated in connection with several exercises following.

After careful practice has made the student proficient in reading and rendering the natural scale by consecutive degrees, the next important step is to acquire the intervals. This means that he is to sing the scales on *thirds* from notes, omitting each alternate degree, and producing sounds indicated on the staff with as little hesitation as possible. At first, unless he has been unusually industrious in learning the scale with consecutive degrees, he will find that his mind will run over the intervening tones, producing audibly only those indicated. It is well to state, however, that one can not make himself proficient, until this practice is rendered altogether unnecessary. Therefore, when the student finds himself expert in the scale with consecutive degrees, he may take up the scales with thirds; practicing them first in connection with consecutive scale, then by themselves, until he is able to render any degrees on the scale at sight.

While it is essential that he should so practice the scales and intervals that he can readily produce any tone indicated in the key of C, which is the model for others, there are certain intervals that are most important in singing. These are indicated in the following example of chords and should be carefully practiced at this point.

IMPORTANT CHORDS IN C MAJOR
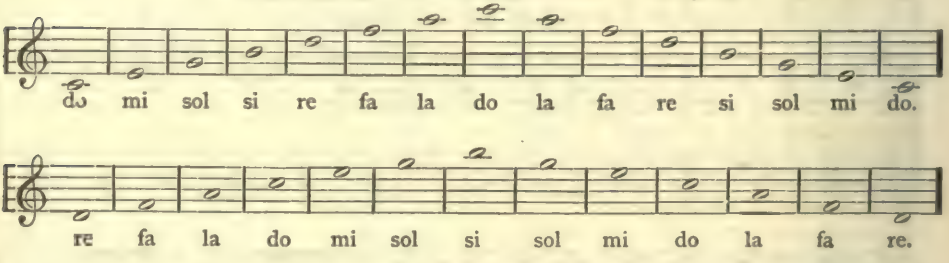


The first indicates intervals of the *third,* the *fifth,* and the *octave;* the second, of the *fourth,* the *sixth,* and the *octave;* the third indicates the *third, fifth,* and the *minor seventh.* Of course, the voice can not produce a chord, such as may be sounded on the piano and several other instruments, but the object of writing them is that they may be rendered as *arpeggios,* running quickly from the lowest to the highest indicated tone in the given time.

In starting to sing a selection in any given key, the proper tones may be obtained by sounding the chord of the *fifth,* or *dominant,* according to the scheme given later.

The matter of beating time must now be briefly discussed, in order to prepare the student for the subsequent exercises. As has already been stated, it is positively essential that the singing of all notes of equal length occupy precisely the same interval of time in each case, as indicated by the beats. Of course, at the start the rate of beating time will be necessarily slower than in the more advanced stages: it must, however, be perfectly even from the first, even though each beat occupy a large fraction of a minute. Carelessness in this particular will cause the time of a piece to vary, hence confirming nearly the worst of all habits in singing. Another thing of great importance is that the hand, in beating time, should be moved as nearly as possible at an even rate of speed; precisely like the vibrating tongue of the metronome. This is essential for the reason that the *singing should follow the time indicated by the hand, and at no time should the hand follow the time of the singing.* For the guidance of the student several specimens of common measures are included, the number of beats being indicated. Such an exercise as No. II will illustrate at once the time value of measures in beats. It is comparatively easy to render either seconds or thirds in the diatonic scale, but the exercise in sounding the tones, indicated in such a piece as this, is a valuable step in practical note-reading.

I. EXERCISES IN *THIRDS* ON C MAJOR
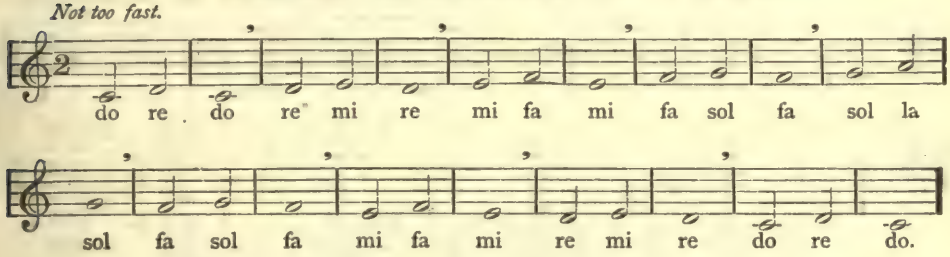


As soon as the student has arrived at the point where he can readily and accurately produce any tone indicated on the staff—which fact he may readily prove by sounding the indicated note on the instrument, *after* giving it, or attempting it, with his voice—he may proceed to the study of the *chromatic scale.* In studying this scale, which proceeds by semitones, the student will find himself faced by a real difficulty; since it requires long and earnest practice to fully and finally identify the sharp or flat occurring between two natural tones. It is a matter, however, that must be studied with the same persistence and thoroughness as has been expended on the *diatonic scale,* since the sounds, indicated by accidental semitones in the key of C, form the degrees in all other keys. It is, therefore, more desirable in running the *chromatic scale,* both upward and downward, to sing them both by sharps and flats; the difference being always indicated by the syllables used, as already explained. This is for the purpose of giving the required training in producing each incidental correctly, whether it be written as a sharp or as a flat.

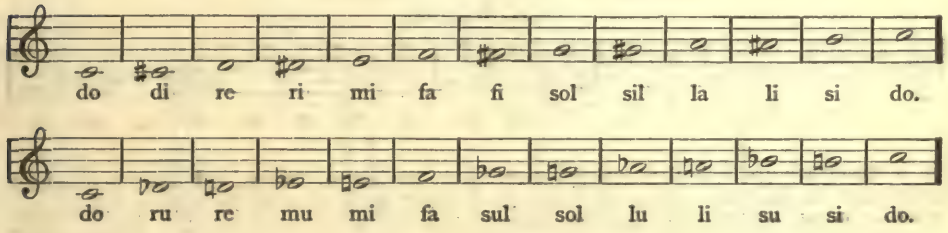
In practicing the scale, particularly the *chromatic,* it is desirable to start by sounding the keynote on the piano or a tuning-fork, without so rendering the other consecutive tones. This enables the student to obtain the habit of self-confidence and independence of instrumental assistance, which is the very thing he is studying to obtain. It is always well, however, to start by sounding the keynote or the chord of the *fifth.* Proficiency in giving accidental semitones may be discovered by the success in rendering such an exercise as No. III, in which the time is indicated, but not the tonic syllables. It is well to associate these syllables so thoroughly in the mind with the tones to which they correspond that their proper names, as well as their tones, may be recognized and rendered whenever they are indicated on the staff.

After the scale of C major is so thoroughly learned that the student can sing it at sight, or correctly render any of its degrees in any order on the staff; and after the *chromatic scale* is mastered in the same way, and with the same result, it is possible to begin systematic study on the other keys, both major and minor. This is true, because, after proficiency in the key of C has been attained, the student has the materials at hand to render him a thoroughly equipped sight-reader. The other keys are, therefore, mere variations on the *chromatic scale* of C; beginning

II. EXERCISE ON INTERVALS IN C MAJOR
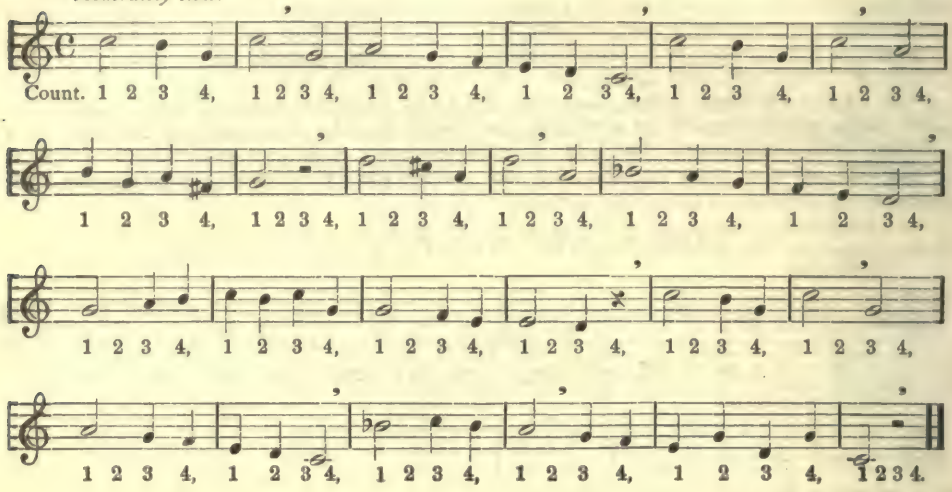


CHROMATIC SCALES IN C MAJOR



III. EXERCISE IN CHROMATICS AND INTERVALS

Note well the beats throughout this piece.

Moderately slow.



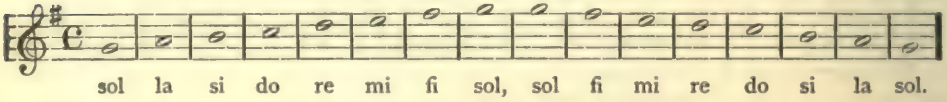
at any desired tone as keynote, and observing the proper intervals of the scale, major or minor, as already indicated.

Since the signs following the clef are not sufficient of themselves to show whether the piece is in the major or minor mode, it is necessary to look through the music in order to find the notes forming the perfect chord—which is to say, the chord of the tonic or keynote as the fundamental, with the third and fifth above it. The melody or the accompaniment should indicate one or the other of these.

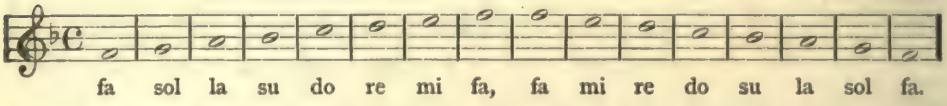
The perfect chords of the various keys, both major and minor, are given in the following examples. The mode in which a piece is written in any given key may be readily recognized in playing or singing it. The minor chord is usually described as having a "more sad and melancholy effect" than that of its corresponding major, or, in more descriptive words, seems to indicate a movement that is restrained or held back.

Although, as already stated, all keys proceed easily after the key of C is thor-
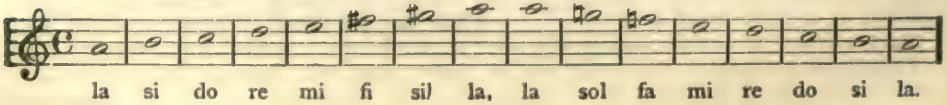
SOL MAJOR.



FA MAJOR.



GAMUT OF LA MINOR, THE RELATIVE OF DO MAJOR.
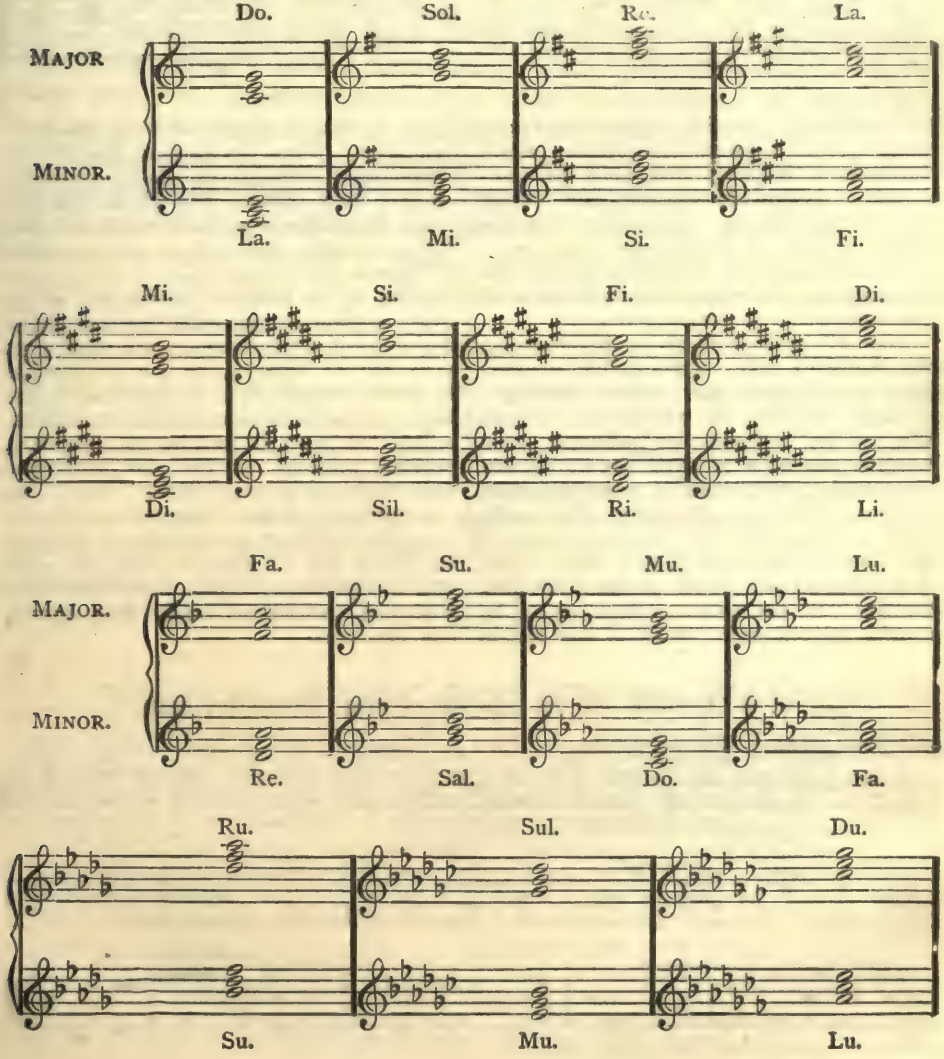


oughly mastered by notes, the student must constantly and carefully observe the signatures in practicing the other keys. This is true, because, except in the minor mode, the sharps and flats are not marked in the measures, but are always sounded throughout, as written at the signature.

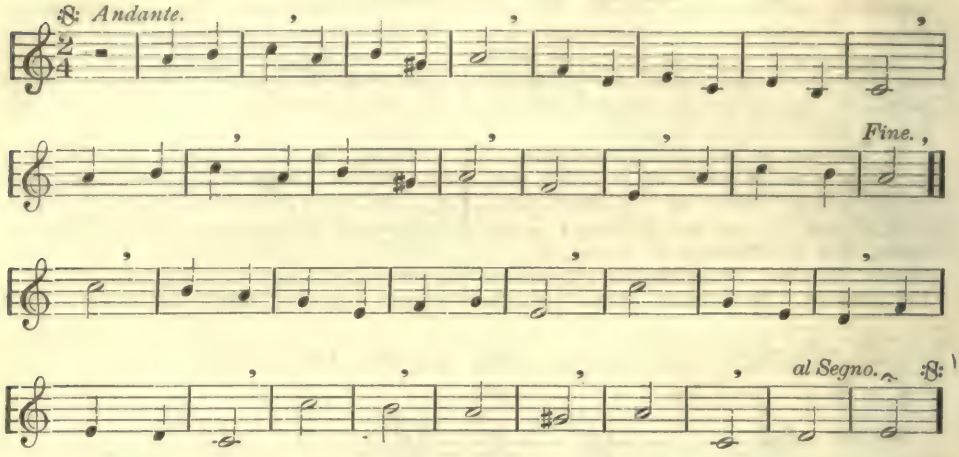
As can not be too strongly emphasized, each key must be taken up in order, preferably in the order of its derivation—thus, C and its relative, A minor; G, one sharp, and its relative, E minor, etc., as shown in the accompanying examples. Furthermore, the student must continue to practice scales and exercises in each successive key, until he can read readily any piece written in that key. As already stated, the keynote and the *third* and *fifth* degrees are the tones by which the student can most easily learn all the rest of the scale.

Bearing in mind that he has to learn two distinct things in studying sight-reading—the tones corresponding to the notes on the staff in each case, and the habit of retaining the time correctly by beats—it is necessary at this point to mention a few things, regarding which the student must

PERFECT CHORDS IN THE MAJOR AND MINOR KEYS



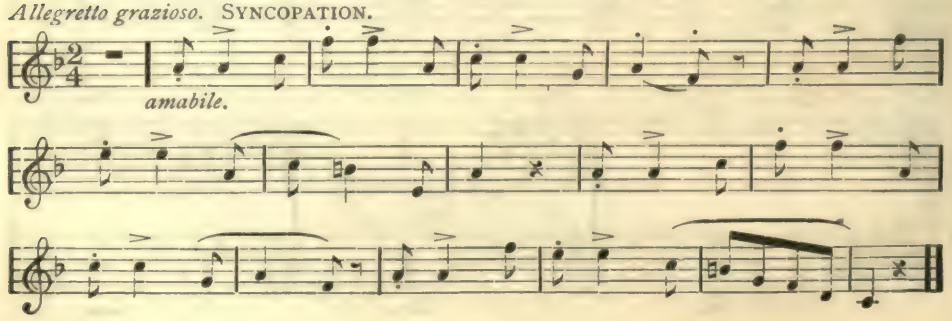
IV. EXERCISE IN LA MINOR



be particularly careful. Foremost among these may be mentioned *syncopation,* which furnishes a difficulty that must be thoroughly mastered in beating time. Since *syncopation* indicates a variation from the proper accent of the measure, the syncopated note must be strongly accented, thus necessitating a corresponding variation from the order of beats already given.

Like all other subjects worth learning, the study of vocal sight-reading involves hard work, which the student must perform for himself. In attempting to master this subject, without the assistance of a teacher, one must be even more conscientious and careful than if under constant personal direction. He must thoroughly read and digest all the directions given in this article, and must follow them to the best of his ability. When he has thoroughly mastered all the exercises here given, he should proceed to the study of any simple hymn tunes or popular airs of which he has notes. Since his success depends entirely upon himself, he should carefully observe two things: (1) Never leave a thing, no matter how hard it may be, until it is thoroughly mastered, as may be proved by comparing the accuracy of your note-reading by a musical instrument, as already explained; (2) since you are studying to read from notes, avoid trusting to your ear or memory, as far as possible. In taking simple pieces for practice, choose those rather with which you are not familiar. In short, in learning to read notes, proceed precisely as you did when you were learning to read words; always endeavoring to derive your ideas of tone from the note you see written on the staff, until you are so familiar with the staff that it represents to your mind tones and semitones, instead of merely lines, spaces, and measures.

V. EXERCISE IN FA MAJOR WITH SYNCOPATION



PHOTOGRAPHY

AMATEUR PHOTOGRAPHY is one of the most attractive and permanently interesting forms of amusement. Its practice includes everything from the simplest of mechanical operations to the intricacies of modern chemistry. Some definite technical instruction, therefore, becomes necessary in order to introduce the beginner to the subjects he must study in connection with making pictures.

In the selection of an instrument, it is desirable to consider whether to buy a simple affair, which will require only the touching of a button, or an apparatus more difficult to operate. The matter is one worth careful consideration, because a good, serviceable camera will prove a lifelong companion, while a toy will never furnish opportunity for an extended study of photography.

An instrument that can be used either with films or dry plates is one of the most recent innovations, and permits of a wide range of work with great convenience for the operator.

In selecting the camera, bear in mind the importance of having the size such as will be useful for your requirements. Should it be intended to print direct from negatives, a camera with plate about five by seven inches would be the most desirable size, while for lantern slides and enlargements a smaller plate, yielding pictures about three and one-quarter by four and one-quarter inches, would be desirable.

PRACTICAL INSTRUCTIONS FOR THE AMATEUR

AS specified by several authorities on photography, the following articles are positively essential to a well-regulated outfit, and should be provided:

(1.) Trays of the various sizes required.

(2.) Scale for weighing grains and ounces; apothecaries' weights.

(3.) A thermometer to measure the temperature of solutions.

(4.) A hydrometer to test the strength of the solutions. (This instrument should be tested for its correctness by measuring a solution of nitrate of silver, 40 grains per fluid ounce, which should indicate 40. In case of a material difference, use the figure the instrument shows instead of 40, or procure a hydrometer which is correct.)

(5.) A one (1) ounce graduate.

(6.) A pint or quart graduate.

(7.) A glass stirring rod.

(8.) Bottles for solutions, labelled and provided with good corks.

(9.) A camel's-hair brush for dusting plates.

Especial care must be taken to thoroughly wash and cleanse the trays after each using.

On frequent occasions, also, they should be thoroughly cleaned with sulphuric or muriatic acid, washed and scrubbed with a brush.

In case it is possible to have more than one lens, better results can be obtained by having one specially adapted for short and the other for long distances, a wide-angle lens being preferable for interiors. The tripod should always be as light as possible, and a mackintosh focusing cloth is the most useful for all weathers.

The work of focusing the object to be taken will be found by the amateur the most difficult thing when first starting out. Of course, where a snap-shot camera is used, there is what we designate a finder attached, and one has only to look at this to see mirrored in it a picture of the scene or object to be taken. By exercising the judgment for a moment, the best distance and elevation at which to snap the button will be easily seen. When using an ordinary camera and tripod it is entirely different, and mathematical accuracy is necessary in order to obtain a satisfactory picture. The first point is to ascertain the focus of the lens with which the camera is fitted. The focus means that point at which the reflected rays of light meet, or, more plainly speaking, the central point of vision to the camera.

It will be apparent to the novice that, owing to the divergency of the rays of light entering the camera, some system of regulating their action on the plate or film must be adopted. By obtaining what is known as the equivalent focus, the operator will learn in what position to place the camera before interposing the shutter. Several exact mathematical formulæ have been used for finding this, but the following simple and practical rule is given by Cramer:

"The equivalent focus of a lens may be ascertained by focusing an object so that it will show on the ground glass in exactly its original size, then measuring the distance from object to ground glass and dividing same by 4. Another way is to focus on the sun and to measure the distance from the optical centre of the combination (where diaphragm is placed), to the ground glass, the sun focus and equivalent focus being approximately the same."

With the modern rapid plates and adjustable lens shutters, it is possible to take photographs in a very small fraction of a second. The time of exposure is adjusted with regard to two things: (1) the number of the diaphragm, and (2) the nature, etc., of the object and its distance from the camera.

Diaphragms are interchangeable, and each is numbered, according to the ratio between its diameter and the focal length of the lens. Thus, with a focal length of 6 inches and a diaphragm diameter of ½ inch, we have $6 \div .5 = 12$, or as usually expressed, F 12. For the same lens and focal length, the relative time exposure with two different diaphragms is found by dividing the smaller of their two numbers (found as above), and squaring the quotient. Thus, if we have F 4 and F 16, the operation is as follows:

$$16 \div 4 = 4$$
$$4 \text{ squared } (4 \times 4) = 16.$$

These figures indicate, therefore, that the diaphragm numbered 16 requires 16 times as long an exposure, under given conditions, as that numbered 4.

English-made camera diaphragms are numbered by a somewhat different system —the numbers used indicating at a glance the relative length of exposure required. This is seen in the following comparative table.

1	equals	F/4
4	"	F/8
8	"	F/11
16	"	F/16
32	"	F/22
64	"	F/32
128	"	F/45
256	"	F/64

Modern cameras for instantaneous work have attachments for varying the size of the diaphragm opening, also for timing the exposure.

In taking instantaneous photographs of moving objects, it is necessary to time the exposure so as to prevent the picture from being blurred, as must certainly result from over-exposure under such conditions. Various mathematical rules have been given for determining this matter, but none of them is wholly practical, except where the photographer has plenty of time beforehand to arrange all details. The best practice is to focus on the object, or on the spot where it will appear—as in the case of a railroad train on a track, or of horses and wagons on a road—and adjust for an exposure according to the following table. As may be readily understood, an object moving toward the camera may be taken with an exposure generally about 3 times longer than an object moving at right

angles to it, or across the line drawn from the lens tube outward.

OBJECT	MOVING TOWARD CAMERA	AT RIGHT ANGLES TO CAMERA
Man walking slowly .	1-15th sec.	1-45th sec.
Cattle grazing . . .	1-15 "	1-45 "
Boating	1-20 "	1-60 "
Man walking, children playing	1-40 "	1-120 "
Pony and cart, trotting	1-100 "	1-300 "
Ordinary cycling . .	1-100 "	1-300 "
Man running and jumping	1-150 "	1-450 "
Cycle racing	1-200 "	1-600 "
Horses galloping . .	1-200 "	1-600 "

Halve exposure for half distance and double for twice distance from object.

Some little experience is necessary to enable one to judge correctly in this matter, as the only really reliable rules are experimental. In determining such points, the photographer should keep careful notes of all plates exposed and of the results obtained in developing them. Thus, in cases of uncertainty, a good practice is to expose three plates; one for about the time prescribed, one for a somewhat shorter period, one for a somewhat longer period, and compare the results obtained.

Where glass plates are used the holders should be numbered, and records kept, on each occasion, of the time of exposure of the plates, etc. With a film, the records may be kept by the numbers appearing as it is turned forward.

THE DARK ROOM

The dark room is a necessary adjunct to the camera, but it need not be a matter of heavy cost to the amateur. A large closet or pantry with a fair-sized window in it will answer better than anything else; otherwise a portion of a room can be used with a corner which may be screened off for the purpose. Total darkness, of course, is not what is required of this chamber, the purpose being only to exclude all actinic, or white, rays of light. Running water will be a great convenience, if available. The exclusion of all undesirable light must be very complete. Thick baize curtains falling very full upon the floor, must be arranged at the doorway. The window should be glazed with ruby glass, of two thicknesses, on the inside of which there should be a curtain or blind of medium-weight yellow material. A developing sink will be the next thing necessary, and for this purpose cheap apparatus can be bought or some simple substitute arranged. The all-important point about the dark room is to have every ray of white, or ordinary, light positively excluded. In order to test the room, and provide that not even the tiniest ray is admitted, even as small as would come through a keyhole, darken the window thoroughly, and then, having adjusted the curtains, watch for some time in the total darkness to see if any streak of light becomes visible.

Some writers recommend that a screen be placed before the entrance wherever possible, making a "zigzag" passage into the dark room and avoiding the necessity of more elaborate precautions for excluding rays of daylight. This is not always possible, however, owing to lack of room, and by the use of properly arranged screens or curtains the end may be quite as fully attained.

Where it is not convenient to have a window in the dark room it will be necessary to use a lamp, fitted with a red or yellow chimney. A swinging screen made on the principle of a looking-glass can be interposed between the lamp and the developing bath, so as to allow of minimizing the light while manipulating the pictures. This because it is not desirable to expose the plate to a strong light until it is thoroughly developed.

A great convenience in the dark room is a fan driven by electrical or water power, not only for the purpose of preventing the temperature from rising too high in hot weather, but also as an assistance in drying the negatives. If the negatives are dried in a hot and sultry atmosphere, they are liable to become too intense. The fan is also useful in keeping the solutions cool, when the bottles are wrapped in wet flannel and set in a shallow dish containing water. It is necessary, however, to maintain a comfortable heat in the dark room during cold weather.

In developing a plate or film, pour a sufficient quantity of the developing solution to cover the plate into a shallow tray. The plate should either be slid into the tray, which is slightly tilted in the process, to ensure an even flow of the liquid over its surface, or it is laid, face upward, in the tray and the developer is poured over it with one sweep of the arm. Air bubbles may be removed with a piece of filtering cotton kept in clean water. During the process of development, the tray should be gently rocked every now and then, care being taken to keep the solution always over its surface, in order to prevent the staining liable to result from exposure to the air.

In order to discover if the plate is suffi-

ciently developed and the figures possess the required density, it may be removed quickly from the tray and held up to the light. This process, however, should be repeated no oftener than necessity requires.

A plate that has been properly exposed will speedily develop; the high lights appearing first and the half-tones and shadows in rapid succession thereafter. If it has been overexposed, the whole image, with lights and shadows, appears simultaneously, but the effect is flat and the details are imperfect. The condition may be remedied by the use of bromide of potassium, as will be presently explained. An underexposed plate will develop slowly, and with imperfect effect on the shadows. This may be remedied by soaking the plate after cleansing in pure water, and then returning it to a fresh developer, or else by using a diluted solution. In either case the process of developing is greatly prolonged, but the result will be a strengthening in the shadows, and, with good care, a satisfactory printing plate. All light should be excluded from an underexposed plate in process of prolonged development.

Some developers have been condemned for their unpleasant effects on the hands, but the objection to those containing strong alkalies and acids can scarcely be overcome, as such ingredients are necessary to proper work. A comparatively new chemical compound known as metol is being advocated by one school of photographers, while pyrogallic acid, or "pyro," hydroquinone, eikonogen, amidol, and half a dozen others are still used extensively. Metol has, perhaps, received more favor recently than any other developer, and many advantages are claimed on account of the rapidity of its action.

A method of development, known as the "Universal," is used by many as combining the quick effects of metol and the slow work of glycin. It is said to be productive of the finest possible results irrespective of the time of exposure. By using this solution as many as two dozen plates can be developed at a time. The outcome is certain and eminently satisfactory; good, quick-printing negatives, full of tone and style, being produced. In this method a large fixing-box with a tight cover to it will be necessary, and a normal plate will develop in about thirty minutes. The formulas are as follows:

No. 1.	Metol	20 grains
	Sulphite soda crystal	3-4 ounce
	Water	20 ounces
No. 2.	Glycin	20 grains
	Sulphite soda crystal	50 "
	Carbonate potass	100 "
	Hot water	2 ounces

Add 18 ounces water when all the ingredients are dissolved.

These two formulas can be combined for neutral results, care being taken not to place the negatives in a bath which has been used for fixing purposes. The plates should be so arranged in the bath that the developer can reach them readily, and the liquid must be kept moving while the plates are immersed.

The so-called "pyrogallic" developer presents many advantages over most others. Like the "Universal," it is a combination of two different solutions, as follows:

No. 1.	Sulphuric acid	10 drops
	Cold boiled water	6 ounces
	Pyrogallic acid	1 ounce
No. 2.	Sulphite of soda (crystals)	6 ounces
	Carbonate of soda (crystals)	4 ounces
	Hot water	15 ounces
	Cool and filter	

For normal exposures, mix 1 drachm of No. 1 and ½ ounce of No. 2 in 3 ounces of pure water.

For an overexposed plate, add to this 3 or 4 drops of a 10 per cent solution of sal bromide of potash in water.

For underexposure, add only water.

After the plate has been sufficiently developed, it should be carefully rinsed and placed in a grooved tank containing the fixing solution. An essential part of this stage of the process is dissolving off the bromide of silver, which has been affected by both the light and the developing solution. The fixing bath should be prolonged some five minutes or so after the silver appears to have been dissolved away, in order to ensure permanency, perfect hardening and freedom from stains.

If properly exposed and developed, a plate will not require intensifying or reducing, but, if necessary, may be immersed in these solutions:

No. 1.	Bichloride of mercury	1 ounce
	Water	20 ounces

The negative is kept immersed in this solution until the film is evenly whitened. It should then be immersed in this solution:

No. 2.	Sulphide of soda	1 ounce
	Water	20 ounces

which will cause it to assume a dark brownish color. The process may be repeated

until the desired density is obtained, after which the plate should be thoroughly washed.

Plates that have been overexposed and overdeveloped may be reduced by the following solutions:

No. 1.	Soda hyposulphite	1 ounce
	Water	16 ounces
No. 2.	Red prussiate of potash	1 ounce
	Water	16 ounces

Take 8 ounces of No. 1 and 1 ounce of No. 2 as a bath for a plate already fixed. If the plate is dry it may be soaked for half an hour. In order to avoid streaks, rinse the negative before holding it up for examination, and when sufficiently reduced wash thoroughly.

Since these reducing solutions may be affected by light, they should be kept carefully in a dark place.

The best fixing solution for general purposes is as follows:

Soda hyposulphite	1 part
Water	4 parts

giving a hydrometer test of about 80. This bath may be used only until it begins to show discoloration, when it should be thrown away.

In order to obtain a superior hardening of the negative that will permit of washing in warm water and drying by artificial heat, a mixture of the following two solutions may be used:

No. 1.	Soda hyposulphite	32 ounces
	Water (7 pints)	112 ounces
No. 2.	Sulphuric acid (C. P.)	1-2 ounce
	Soda sulphite (dry)	3 ounces
	Chrome alum (powdered)	2 ounces
	Water	32 ounces

In mixing No. 2 it is important to measure the ingredients accurately, and pour them into the water in the order named. No. 2 should then be poured into No. 1, never the reverse, the pouring being accompanied by constant stirring, in order to prevent precipitation and consequent ineffectiveness of the combined solution. In cold weather, half the quantity of No. 2 is usually sufficient to secure good results.

This bath may be used repeatedly without becoming discolored, but should be replaced by a new one as soon as it appears to have become exhausted. The negative should be left in solution for from 5 to 10 minutes after the silver has been dissolved.

Spots on the negative, or pinholes, as they are termed, should be looked after before the printing is attempted. The best method is to touch them with carmine, using a very fine brush for the purpose. Other defects in the negative are remedied by what is known as retouching. Dark marks are either painted over on the negative or in the print, and lighter ones may be fixed by using a soft lead-pencil.

PRINTING

It is probable that the amateur will find it more convenient to buy paper ready cut for printing his pictures on from the negatives. There are numerous kinds upon the market, each having its advocates, and in some instances being better suited to certain purposes.

In order to spare time and considerable trouble the amateur will be wise to use paper which is ready prepared and sensitized, rendering the amateur's work comparatively easy from this stage on. Carbon papers are used much less than formerly, the albumenized and the gelatino-citrochloride papers now having the preference. It is claimed for the latter that they produce prints of greater richness and brilliancy than any others.

A very essential point in the amateur's outfit is to get a few good printing frames, as it will spare many troubles and annoyances in the course of the work. See that the back of the frame is made of hard wood, so as to prevent warping or shrinking, as the spring must always work easily yet firmly. Otherwise the prints will shift about, causing any amount of inconvenience and disappointment. It is well to have the inner side of the back of the frame lined with velvet. A small cloth pad, cut rather smaller than the size of the negative, will also be required. *When films are used place a piece of glass in the printing frame,* with the back of the negative toward the glass, to prevent the film from curling.

Before placing the paper in the frame in contact with the negative, dust both thoroughly with either a velvet or a camel's-hair brush. In order to get the negative and paper arranged in correct position in the frame, so that the printing will be straight, hold the frame up to the light so as to be sure that both are exactly in place. Always be careful to print from the film side of the negative, or disastrous results will ensue. The printing frame and accessories should be kept well aired and free from damp, in order that blurring may be avoided.

Exposure to the sun is not necessary for printing, but when the paper and film are firmly fixed in the frame, a spot should be selected where the light is steady. The frame should then be placed at an angle of 30 degrees toward the point from which the light comes. The shadow of a building often affords a suitable place for the frame, and window-sills are commonly used to stand the frame upon. The face of the frame should be placed opposite to the sky at the angle stated, and care taken that the sun does not strike the frame, as it will ruin the proofs by casting shadows on them.

When the frame is placed in sunlight the glass should be covered with tissue-paper, and particular notice taken that there are no pinholes in the film, because they will undoubtedly cause markings on the print.

Skill in printing can only be acquired with practice and familiarity with materials used, as there are some papers which print much more rapidly than others. Allowance must be made for the subsequent toning and fixing, which will have the effect of further lightening the print. A good rule is to first print to the finished shade and then allow a little for toning out. Where there is an unequal amount of light and shade in a negative, it should be printed darker. This rule also holds with a thin, dense negative. It will be necessary to open the frame to see how far the printing has proceeded. Care should be taken to shield the prints from a direct light when this is done.

When all the detail in the more obscure portions of the negative is visible on the proof, the printing may, as a rule, be considered dark enough, and the proofs should be placed in a light-proof box which is entirely free from dust. When, through accident, a good negative has not been obtained, and it is not possible to obtain one, it sometimes becomes necessary to use the best taken. In this case, there are many ways of improving the negative so that a fairly satisfactory result can be obtained. When a negative is weak, the gelatino-citro-chloride paper is the best to print upon.

In order to strengthen a weak negative place two sheets of thin white tissue-paper at its back, so as to prevent the light from striking it too strongly. This will secure a better result than could come from too rapid printing.

Negatives can sometimes be colored for the purpose of equalizing the lights and shadows, but in that case must never be exposed to direct sunlight. Where there is too dense a shadow on certain parts of a portrait, they may be lightened with yellow paint or Prussian blue.

Errors in focusing may often be palliated by careful trimming. It will generally be found necessary to trim the print in order to get it in proper shape for mounting. There will either be too much fore or back ground, odd spacing at the sides and other irregularities which the judicious use of the trimming-knife will overcome.

TONING AND FIXING

Fortunately there are ready-toned papers now and the amateur is not compelled to master the rather difficult process of toning, unless from a desire to thoroughly understand all details.

Toning is a very delicate operation, and undoubtedly a few unfortunate experiments will precede the accomplishment of expert results. For the ready sensitized paper, which it is probable the amateur will use, the borax bath is recommended. This is made from the following formula: Gold chloride, 1 grain; borax, 100 grains; water, 10 ounces. It should be made about an hour before using. Purple tints can be obtained from this toning, but not blue or cold tones. The prints should not be allowed to remain in the solution too long, as otherwise the action of the chemicals will produce the opposite results to those desired. The best rule to follow is to watch the whites in the print, and as soon as bleaching or a bluish tinge commences to show, to take them out, as the shadows will be already sufficiently toned.

The process of toning can be stopped in gelatine prints when they are taken from the bath by putting a handful of salt into the toning bath and redipping them. The toning bath for gelatine papers is made as follows: Gold chloride, 2 grains; sulphocyanide of ammonium, 30 grains; water, 16 ounces. Toning by gaslight is often preferred by those who use papers which have been sensitized by themselves.

Toning after fixing is resorted to by some photographers. The process is as follows: Take three ounces of hypo and dissolve in twenty ounces of water to make the fixing bath. In this immerse the prints for ten minutes. Then wash them for two hours. Take a grain of gold chloride and increase it with water to one ounce. For

one minute immerse the prints in this and then remove to the ordinary toning bath. Be careful to watch the toning by reflected light, and, when perfect, wash the prints for another hour and they will be ready for enamelling or burnishing.

Among the many kinds of paper made for direct printing from negatives, we find two distinct classes: (*a*) the printing-out, and (*b*) the developing. In the first class are such papers as Solio, Maximo, Platinum, and blue-print, each of which is to be treated in accordance with the written directions accompanying the package containing it.

In the second class are the developing papers, which show no effect of the contact with light, until placed in the developing solution. Then the image appears at once, constantly increasing until the required density is attained. Progress may be checked at any point by placing the print in water made slightly acid by using ½ ounce of acetic acid in 1 quart of water. The print is then placed in the fixing bath for about ten minutes, after which it is washed in running water for about one hour.

Among such papers are the Velox, Cyko, Argo, etc., each of which is treated in accordance with the printed directions accompanying the package. All of them may be used to print by artificial light.

A good general formula for use with any of these papers may be made as follows:

Metol	8 grains
Soda sulphite (crystals)	240 grains
Hydroquinone	31 grains
Carbonate of soda (crystals)	400 grains
Water	10 ounces

To this may be added about 6 drops of a 10 per cent solution of bromide of potash.

Should prints become stained or show black lines, the effect may be renewed by the use of

Oronol	1-2 ounce
Water	1 1-2 ounces

An overexposed print may also be cleared by the use of this same solution. It should be applied to the face of the print with a piece of cotton or a camel's-hair brush.

For a fixing bath use

Soda hyposulphite	1 ounce
Water	4 ounces

ENAMELLING

The prints can be taken direct from the bath. See that the enamelling plate is clean, free from scratches, and has a brilliant surface. Warm the plate slightly and rub roughly over it a piece of pure beeswax. With a dry, soft flannel rag warm the plate until the wax melts. With the rag rub it all over the plate until every particle of the glass is covered. Being sure of this, commence rubbing the wax off again on the flannel. Rub lightly, in a circular direction, and evenly distribute all over the plate.

When the wax has almost disappeared from the glass, take a clean flannel and give it a final polishing. Stop as soon as the wax has become invisible over the entire surface of the glass, which will then really be covered by a thin film of wax. The glass is now in perfect condition, and the prints, after being allowed to drip for a few minutes, should be laid, face downward, one at a time, on the plate glass. Press them firmly into contact with it and use a squegee to remove any air-bells. Then stand the glass on end in a dry, warm place, and as the prints dry they will gradually drop off, each one being beautifully polished. If any of the prints stick, they can be removed by loosening the edges with a knife.

MOUNTING

The final process of mounting is one requiring only care and cleanliness. There are any number of good mountants in the market, although it may be well to give a formula in case one may desire to make his own. Dissolve one ounce of gum arabic in three ounces of water and mix in a mortar with one ounce of starch. Heat in a dish until clear.

When the mountant is ready for use, lay the prints face downward upon some oiled paper and carefully apply the liquid to the back. Then place it on the mount or cardboard and squegee it so as to make sure of its adhering firmly. Laid on top of each other with glass plates and small blocks of wood between, the cards soon dry and are sure to be perfectly flat when unpacked. We now have our photograph ready for any purpose, having gone through all the various processes necessary to perfect it.

OUTDOOR PORTRAITURE

In taking a portrait out of doors, the sitter should be placed so as to face the north, out of the direct sunshine. Employ a friend to hold a large umbrella at

such an angle as will shade one side of the sitter's face and the top of head. The exact position for the umbrella can be ascertained by finding at what angle a good modelling of the features is obtainable. For a background an old yellow blanket, kept moving while the exposure is made, will serve very well, and a good picture can be obtained with little trouble.

In landscape photography, the easiest method to pursue, until one desires to attempt more ambitious things, is what photographers term "natural focusing." The main point of this is to focus the principal object in the view, allowing all others to be subordinate to it. The result is a picture exactly representing the scene as it appears to the naked eye. The rules given concerning exposures, according to the laws regulating the foci, will prove safe for general work.

Objects in motion can be photographed successfully by observing the position which may be defined as essentially characteristic. It is to seize this that the operator must watch, making an exposure just at the moment. When the position of the object is oblique, either from or toward the camera, results may be obtained more easily and satisfactorily. This rule should always be remembered in photographing animals, vehicles, or vessels in motion. The shorter the exposure the better the results.

In marine negatives, the composition should be the reverse of that for a landscape, because the more spirited it is the more pleasing the result. Care should be taken not to overexpose the plate or blurring will result, because the reflected light on the water is so much stronger than that found in landscapes. In this class of pictures, the shorter the exposure the better.

The way that fancy pictures are made and tricks performed with the camera may be worth mentioning. A square piece of black paper is placed in front of the lens at a distance equal to three-eighths of the back focus, so as to hide half the range of the lens. One exposure is made, and the piece of paper is then turned over so as to cover the other half of the range. Then another exposure is taken, any objects in the exposed part of the range having been meanwhile transferred to the other half before the lens was uncapped. Care should be taken not to move the instrument while the exposures are being made. This is the way in which spirit photographs are obtained.

The beginner will do well to bear in mind the different conditions in regard to photographing in summer and winter. Quicker plates, as a rule, will be found more advantageous in the winter and a larger stop can be used on the camera. In developing plates or films it will be found advisable to warm up the developer slightly in very cold weather, so that it will work on the negatives more quickly and effectively.

ARCHITECTURE

ARCHITECTURE, or the art of planning and raising edifices, appears to have been among the earliest inventions. The first habitations of men were such as nature afforded, with but little labor on the part of the occupant, and sufficient to supply his simple wants —grottos, huts, and tents. In early times, the country of Judea, which is mountainous and rocky, offered cavernous retreats to the inhabitants, who accordingly used them instead of artificial places of shelter. From various passages in Scripture, it appears that these caves were often of great extent, for, in the sides of the mountain of Engedi, David and six hundred men concealed themselves. In the course of time, art was employed to fashion the rude cavernous retreats, and to excavate blocks by which rude buildings were compiled in more convenient situations. The progress of architecture, however, from its first dawn, differed in almost every different locality. Whatever rude structure the climate and materials of any country obliged its early inhabitants to adopt for their temporary shelter, the same structure, with all its prominent features, was afterward kept up by their refined and opulent posterity.

From the cause now mentioned the Egyptian style of building had its origin in the cavern and mound; the Chinese architecture, with its pavilion roofs and pointed minaret, is molded from the Tartar tent; the Grecian is derived from the wooden cabin; and the Gothic from the bower of trees. It is evident that necessity as much as choice or chance led to the adoption of the different kinds of edifices.

After mankind had learned to build houses, they commenced the erection of temples to their gods, and these they made still more splendid than private dwellings. Thus architecture became a fine art, which was first displayed on the temples, afterward on the habitations of princes and public buildings, and at last became a universal want in society.

Traces of these eras of advancement in the art of erecting buildings are found in various quarters of the globe, especially in Eastern countries, where the remains of edifices are discovered of which fable and poetry can alone give any account. The most remarkable of these vestiges of a primitive architecture are certain pieces of masonry in the island of Sicily as well as in some other places, called the works of the Cyclops, an ancient

and fabulous race of giants, mentioned by Homer in his Odyssey. By whom these walls were actually erected is unknown.

Of the progressive steps from comparative rudeness to elegance of design, history affords no certain account, and we are often left to gather facts from merely casual notices. The most ancient nations known to us, among whom architecture had made some progress, were the Babylonians, whose most celebrated buildings were the temple of Belus, the palace and hanging gardens of Semiramis; the Assyrians, whose capital, Nineveh, was rich in splendid buildings; the Phœnicians, whose cities, Sidon, Tyre, Aradus, and Sarepta, were adorned with equal magnificence; the Israelites, whose temple was considered as a wonder of architecture; the Syrians and the Philistines. No architectural monument of these nations has, however, been transmitted to us; but we find subterraneous temples of the Hindoos, hewn out of the solid rock, upon the islands Elephanta and Salsette, and the mountains of Ellora. These temples may be reckoned among the most stupendous ever executed by man. The circuit of the excavations is about six miles. The temples are 100 feet high, 145 feet long, and 62 feet wide. They contain thousands of figures, appearing, from the style of their sculpture, to be of ancient Hindoo origin. Everything about them, in fact, indicates the most persevering industry in executing one of the boldest plans.

VARIOUS STYLES OF ARCHITECTURE

EGYPTIAN STYLE OF ARCHITECTURE

ALL the architectural remains of ancient times sink into insignificance when compared with those of Egypt. The obelisks, pyramids, temples, palaces, and other structures of this country, are on the grandest scale, and such as could only have been perfected by a people considerably advanced in refinement. The elementary features of Egyptian architecture were chiefly as follows: 1. Their walls were of great thickness, and sloping on the outside. This feature is supposed to have been derived from the mud walls, mounds, and caverns of their ancestors. 2. The roofs and covered ways were flat, or without pediments, and composed of blocks of stone, reaching from one wall or column to another. The principle of the arch, although known to the Egyptians, was seldom if ever employed. 3. Their columns were numerous, close, short, and very large, being sometimes ten or twelve feet in diameter. They were generally without bases, and had a great variety of capitals, from a simple square block, ornamented with hieroglyphics or faces, to an elaborate composition of palm-leaves, not unlike the Corinthian capital. 4. They used a sort of concave entablature or cornice, composed of vertical flutings or leaves, and a winged globe in the centre. 5. Pyramids, well known for their prodigious size, and obelisks, composed of a single stone, often exceeding 70 feet in height, are structures peculiarly Egyptian. 6. Statues of enormous size, sphinxes carved in stone, and sculptures in outline of fabulous deities and animals, with innumerable hieroglyphics, are the decorative objects which belong to this style of architecture.

The main character of Egyptian architecture is that of great strength with irregularity of taste. This is observable in the pillars of the temples, the parts on which the greatest share of skill has been lavished. Figures 1—4 are examples.

In these columns we may notice that sturdiness is the prevailing characteristic. The design has been the support of a great weight, and that without any particular regard to proportion or elegance, either as a whole or in parts. When assembled in rows

or groups, the columns had an imposing effect, because, from their height and thickness, they filled the eye and induced the idea of placid and easy endurance. In



FIG. 1. FIG. 2. FIG. 3. FIG. 4.

Examples of Egyptian Columns.

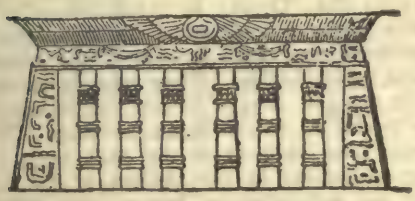


FIG. 5.—The Facade of an Egyptian Temple.

Figure 5, which represents the exterior of a temple, this simple and imposing character is conspicuous.

GREEK STYLE OF ARCHITECTURE

From Egypt, the architectural art spread to Greece, where it passed from the gigantic to the chaste and elegant. The period in which it flourished in the greatest perfection was that of Pericles, about 44 before Christ, when some of the finest temples at Athens were erected. After this, it declined with other arts, and was carried to Rome, where, however, it never attained the same high character. Before describing the various orders of Grecian and Roman architecture, it will be advantageous to explain the terms ordinarily employed in reference to the component parts of buildings.

EXPLANATION OF TERMS

The front or façade of a building, made after the ancient models, or any portion of it, may represent three parts, occupying different heights: The pedestal is the lower part, usually supporting a column; the single pedestal is wanting in most antique structures, and its place is supplied by a stylobate; the stylobate is either a platform with steps, or a continuous pedestal, supporting a row of columns. The lower part of a finished pedestal is called the plinth; the middle part is the die, and the upper part the cornice of the pedestal, or surbase. The column is the middle part, situated upon the pedestal or stylobate. It is commonly detached from the wall, but is sometimes buried in it for half its diameter, and is then said to be engaged. Pilasters are square or flat columns attached to walls. The lower part of a column, when distinct, is called the base; the middle, or longest part, is the shaft; and the upper or ornamented part, is the capital. The swell of the column is called the entasis. The height of columns is measured in diameters of the column itself, taken always at the base. The entablature is the horizontal continuous portion which rests upon the top of a row of columns. The lower part of the entablature is called the architrave or epistylium. The middle part is the frieze, which, from its usually containing sculpture, was called zophorus by the ancients. The upper or projecting part is the cornice. A pediment is the triangular face produced by the extremity of a roof. The middle or flat portion inclosed by the cornice of the pediment is called the tympanum. Pedestals for statues, erected on the summit and extremities of a pediment, are called acroteria. An attic is an upper part of a building, terminated at top by a horizontal line instead of a pediment. The different moldings in architecture are described from their sections, or from the profile which they present when cut across. Of these, the torus is a convex molding, the section of which is a semicircle, or nearly so; the astragal is like the torus, but smaller; the ovalo is convex, but its outline is only the quarter of a circle; the echinus resembles the ovalo, but its outline is spiral, not circular; the scotia is a deep concave molding; the cavetto is also a concave, and occupying but a quarter of a circle; the cymatium is an undulated molding, of which the upper part is concave and the lower convex; the ogee or talon is an inverted cymatium; the fillet is a small square or flat molding. In architectural measurement, a diameter means the width of a column at the base. A module is half a diameter. A minute is a sixtieth part of a diameter.

In representing edifices by drawings, architects make use of the plan, elevation, section, and perspective. The plan is a map or design of a horizontal surface,

showing the ichnographic projection, or groundwork, with the relative position of walls, columns, doors, etc. The elevation is the orthographic projection of a front or vertical surface; this being represented, not as it is actually seen in perspective, but as it would appear if seen from an infinite distance. The section shows the interior of a building, supposing the part in front of an intersecting plane to be removed. The perspective shows the building as it actually appears to the eye, subject to the laws of scenographic perspective. The three former are used by architects for purposes of admeasurement; the latter is used also by painters, and is capable of bringing more than one side into the same view, as the eye actually perceives them. As the most approved features in modern architecture are derived from buildings which are more or less ancient, and as many of these buildings are now in too dilapidated a state to be easily copied, recourse is had to such initiative restorations, in drawings and models, as can be made out from the fragments and ruins which remain. In consequence of the known simplicity and regularity of most antique edifices, the task of restoration is less difficult than might be supposed. The groundwork, which is commonly extant, shows the length and breadth of the building, with the position of its walls, doors, and columns. A single column, whether standing or fallen, and a fragment of the entablature, furnish data from which the remainder of the colonnade, and the height of the main body, can be made out.

Grecian temples are well known to have been constructed in the form of an oblong square or parallelogram, having a colonnade or row of columns without, and a walled cell within. The part of the colonnade which formed the front portico was called the pronaos, and that which formed the back part the posticus. There were, however, various kinds of temples, the styles of which differed; thus, the prostyle had a row of columns at one end only; the amphiprostyle had a row at each end; the peripteral had a row all round, with two inner ones at each end; and the dipteral had a double row all round, with two inner ones at each end, making the front three columns deep.

The theatre of the Greeks, which was afterward copied by the Romans, was built in the form of a horseshoe, being semicircular on one side and square on the other. The semicircular part, which contained the audience, was filled with concentric seats, ascending from the centre to the outside. In the middle or bottom was a semicircular floor, called the orchestra. The opposite, or square part, contained the actors. Within this was erected, in front of the audience, a wall, ornamented with columns and sculpture, called the scena. The stage or floor between this part and the orchestra was called the proscenium. Upon this floor was often erected a movable wooden stage, called by the Romans pulpitum. The ancient theatre was open to the sky, but a temporary awning was erected to shelter the audience from the sun and rain.

ORDERS OF GREEK ARCHITECTURE

Aided, doubtless, by the examples of Egyptian art, the Greeks gradually improved the style of architecture, and originated those distinctions which are now called the "Orders of Architecture." By this phrase is understood certain modes of proportioning and decorating the column and its entablature. They were in use during the best days of Greece and Rome, for a period of six or seven centuries. They were lost sight of in the dark ages, and again revived by the Italians at the time of the restoration of letters. The Greeks had three orders, called the Doric, Ionic, and Corinthian. These were adopted and modified by the Romans, who also added two others called the Tuscan and Composite.

The Doric Order.—This is the earliest of the Greek orders, and we see in it a noble simplicity on which subsequent orders were founded. One of the most correct examples is that given in Figure 6. The shaft of the Doric column had no base, ornamental or otherwise, but rose directly from the smooth pavement or stylobate. It had twenty flutings, which were superficial, and separated by angular edges. The perpendicular outline was nearly straight. The Doric capital was plain, being formed of a few annulets or rings, a large echinus, and a flat stone at top called the abacus. The architrave was plain; the frieze was intersected by oblong projections called triglyphs, divided into three parts by vertical furrows, and ornamented beneath by guttæ, or drops. The spaces between the triglyphs were called metopes, and commonly contained sculptures. To have a just idea of the Doric, therefore, we must go back to the pure Grecian era. The finest examples are those of the temple of Theseus and the Parthenon (Figure 7) at Athens. The Par-

thenon, which is now a complete ruin, has formed a model in modern architecture. It was built by the architect Ictinus, during the administration of Pericles, and its decorative sculptures are supposed to have been executed under direction of Phidias. The platform or stylobate consists of three steps, the uppermost of which is 227 feet in length

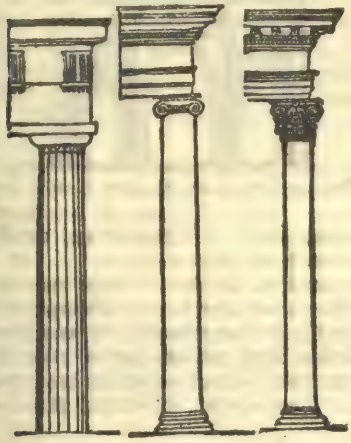


FIG. 6. FIG. 8. FIG. 9.
Doric, Ionic and Corinthian Columns.

and 101 in breadth. The number of columns is eight in the portico of each front, and seventeen in each flank, besides which there is an inner row of six columns, at each end of the cell.

THE IONIC ORDER.—In this order the shaft begins to lengthen, and to possess a degree of ornament, but still preserving a great degree of simplicity of outline. In the best examples, as represented in Figure 8, the



FIG. 7.—Facade of the Parthenon at Athens.

column was eight or nine diameters in height. It had a base often composed of torus, a scotia, and a second torus, with intervening fillets. This is called the Attic base. Others were used in different parts of Greece. The capital of this order consisted of two parallel double scrolls, called volutes, occupying opposite sides, and supporting an abacus, which was nearly square, but molded at its edges. These volutes have been considered as copied from ringlets of hair, or perhaps from the horns of Jupiter Ammon. The Ionic entablature consisted of an architrave and frieze, which were continuous or unbroken, and a cornice of various successive moldings, at the lower part of which was often a row of dentels, or square teeth. The examples at Athens of the Ionic order were the temple of Erectheus, and the temple on the Ilissus, both now destroyed. Modern imitations are common in public edifices.

THE CORINTHIAN ORDER.—This was the lightest and most highly decorated of the Grecian orders. The base of the column resembled that of the Ionic, but was more complicated. The shaft was often ten diameters in height, and was fluted like the Ionic. The capital was shaped like an inverted bell, and covered on the outside with two rows of leaves of the plant acanthus, above which were eight pairs of small volutes. Its abacus was molded and concave on its sides, and truncated at the corners, with a flower on the centre of each side. The entablature of the Corinthian order resembled that of the Ionic, but was more complicated and ornamented, and had, under the cornice, a row of large oblong projections, bearing a leaf or scroll on their under side, and called modillions. No vestiges of this order are now found in the remains of Corinth, and the most legitimate example at Athens is in the choragic monument of Lysicrates. The Corinthian order was much employed in the subsequent structures of Rome and its colonies. The finest Roman example of this order is that of three columns in the Campo Vaccina, at Rome, which are commonly considered as the remains of the temple of Jupiter Stator.

CARYATIDES.—The Greeks sometimes departed so far from the strict use of the orders as to introduce statues, in the place of columns, to support the entablature. Statues of slaves, heroes, and gods appear to have been employed occasionally for this purpose. The principal specimen of this kind of architecture which remains is in a portico called Pandroseum, attached to the temple of Erectheus at Athens, in which statues of Carian females, called Caryatides, are substituted for columns.

ROMAN STYLE OF ARCHITECTURE

Roman architecture possessed no originality of any value; it was founded on

copies of the Greek models, and these were modified to suit circumstances and tastes. The number of orders was augmented by the addition of the Tuscan and Composite.

TUSCAN ORDER.—This order is not unlike the Doric, and is chaste and elegant. As represented in Figure 10, the shaft had a simple base, ornamented with one torus, and an astragal below the capital. The proportions were seven diameters in height. Its entablature, somewhat like the Ionic, consisted of plain running surfaces.

THE COMPOSITE ORDER.—Of this there were various kinds, differing less or more either in the ornaments of the column or in the entablature. The simplest of this hybrid order was that which we represent in Figure 11, which may be observed to combine parts and proportions of the Doric, the Ionic, and the Tuscan.

The temples of the Romans sometimes resembled those of the Greeks, but often

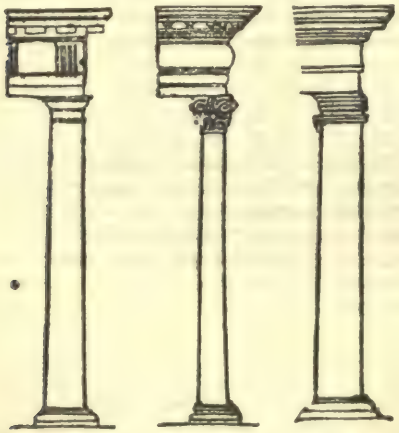


FIG. 11. FIG. 12. FIG. 10.

Types of Roman Columns.

differed from them. The Pantheon, which is the most perfectly preserved temple of the Augustan age, is a circular building, lighted only from an aperture in the dome, and having a Corinthian portico in front. The amphitheatre differed from the theatre, in being a completely circular or rather elliptical building, filled on all sides with ascending seats for spectators, and leaving only the central space, called the arena, for the combatants and public shows. The Coliseum is a stupendous structure of this kind. The aqueducts were stone canals, supported on massive arcades, and conveying large streams of water for the supply of cities. The triumphal arches were commonly solid oblong structures ornamented with sculptures, and open with lofty arches for passengers below. The edifice of this kind most entire in the present day is the



FIG. 13.—The Arch of Constantine at Rome.

triumphal arch of Constantine, at Rome, represented in Figure 13.

The basilica of the Romans was a hall of justice, used also as an exchange or place of meeting for merchants. It was lined on the inside with colonnades of two stories, or with two tiers of columns, one over the other. The earliest Christian churches at

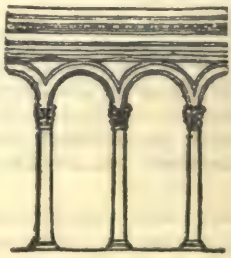


FIG. 14.—Roman Arches.

Rome were sometimes called basilicæ, from their possessing an internal colonnade. The monumental pillars were towers in the shape of the column on a pedestal, bearing a statue on the summit, which was approached by a spiral staircase within. Sometimes, however, the column was solid. The thermæ, or baths, were vest structures, in which multitudes of people could bathe at once. They were supplied with warm and cold water and fitted up with numerous rooms for purposes of exercise and recreation.

ITALIAN STYLE OF ARCHITECTURE

After the dismemberment of the Roman Empire, the arts degenerated so far that a custom became prevalent of erecting new buildings with the fragments of old ones, which were dilapidated and torn down for

the purpose. This gave rise to an irregular style of building, which continued to be imitated, especially in Italy, during the dark ages. It consisted of Grecian and Roman details, combined under new forms, and piled up into structures wholly unlike the unique originals. Hence the names Græco-Gothic and Romanesque architecture have been given to it. After this came the Italian style, which was professedly a revival of the classic styles of Greece and Rome, but adapted to new manners and wants—a kind of transition from ancient to modern times. Its great master was Andrea Palladio, a Venetian (born 1518—died 1580).

There is considerable variety and beauty in the foliate and other enrichments of an architectural character in many structures in Italy, but very little ornament enters into the columnar composition of Italian architecture. Friezes, instead of being sculptured, are swollen; the shafts of columns are very seldom fluted, and their capitals are generally poor in the extreme; mouldings are indeed sometimes carved, but not often; rustic masonry, ill-formed festoons, and gouty balustrades for the most part supply the place of chaste and classic ornaments.

CHINESE STYLE OF ARCHITECTURE

The ancient Tartars and wandering shepherds of Asia appear to have lived from time immemorial in tents, a kind of habitation adapted to their erratic life. The Chinese have made the tent the elementary feature of their architecture; and of



Fig. 15.—Type of Chinese Pagoda.

their style any one may form an idea by inspecting the figures which are depicted upon common China ware. Chinese roofs are concave on the upper side, as if made of canvas instead of wood. A Chinese portico is not unlike the awnings spread over shop-windows in summer time. The veranda, sometimes copied in dwelling-houses, is a structure of this sort. The Chinese towers and pagodas have concave roofs, like awnings, projecting over their several stories. A representation of this barbaric style of erection is given in Figure 15. Such structures are built with wood or brick; stone is seldom employed.

SARACENIC, MOORISH, AND BYZANTINE

The Arabs, or Saracens, as they are more usually called, and the Moors, introduced into Spain certain forms of architecture

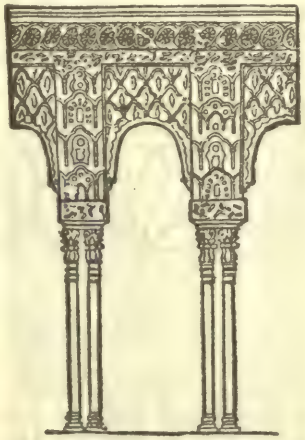


Fig. 16.—Example of Saracenic Arch.

which differed considerably from the Grecian in appearance, though founded on its remains in Asia and Africa. The chief peculiarity of this architecture was the form of the arch; the Saracens are understood to have made it of greater depth than width, thus constituting more than half a circle or ellipse, and therefore unphilosophical and comparatively insecure (Figure 16); while the Moorish style was principally distinguished by arches in the form of a horseshoe or a crescent.

We associate with these styles another, which arose at Constantinople, called the Byzantine, likewise formed on the remains of Grecian art, and partaking of a slightly Eastern character. It became known in western Europe along with the Lombard, another degenerate Grecian style, about the ninth and tenth centuries.

GOTHIC OR POINTED STYLE

The term Gothic is a modern error, which, being now impossible to correct, is suffered to remain as the generally distin-

guishing appellation of the kind of architecture possessing pointed arches. This style originated in Germany about the middle of the thirteenth century, and was zealously pursued as the leading fashion for ecclesiastical structures all over Europe. Executed by a class of skilled artisans, who wandered from country to country, the finest specimens of the pointed style are the cathedrals of Strasburg, Cologne, and Antwerp, and the splendid abbeys of Melrose and Westminster.

In this fanciful and picturesque style of architecture, the slender columns, always united in groups, rise to a lofty height, resembling the giants of the grove, in whose dark shade the ancient Teuton used to build his altar. In the obscure depth of the dome,

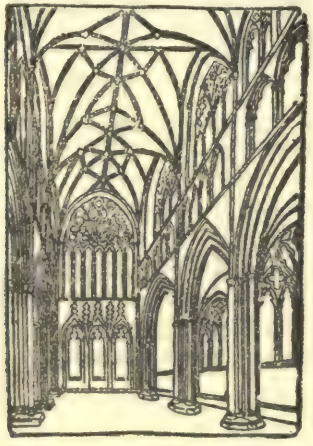


FIG. 17.—Interior of a Gothic building, showing groining in the roof and Gothic Arches.

the mind is awakened to solemn devotional feelings.

When the circular arch totally disappeared in 1220, the Early English style commenced. The windows of this style were at first very narrow in comparison with their height; they were called lancet-shaped, and were considered very elegant; two or three were frequently seen together, connected by dripstones. In a short time, however, the windows became wider, and divisions and ornaments were introduced. Sometimes the same window was divided into several lights, and frequently finished at the top by a light in the form of a lozenge, circle, trefoil, or other ornament.

About the year 1300, the architecture became more ornamental, and from this circumstance received the name of the Decorated English style, which is considered the most beautiful for ecclesiastical buildings. The transition from the Decorated to the Florid or Perpendicular style was very gradual. Ornament after ornament was added, till simplicity disappeared beneath the extravagant additions; and about the year 1380, the architecture became so overloaded and profuse, that it obtained the title of Florid, which by some persons is called the Perpendicular, because the lines of division run in upright or perpendicular lines from top to bottom, which is not the case in any other style.

DEFINITIONS OF PARTS

Gothic architecture being for the most part displayed in ecclesiastical edifices, it may be of service to explain the usual plan of construction of these buildings. A church or cathedral is commonly built in the form of a cross, having a tower, lantern, or spire erected over the place of intersection. The part of the cross situated toward the west is called the nave. The opposite or eastward part is called the choir, and within this is the chancel. The transverse portion, forming the arms of the cross, is called the transept, one limb being called the northern and the other the southern transept.

Generally, the nave is larger than the choir. If the nave, choir, and transepts be all of the same dimensions, the form is that of a Greek cross. When the nave is longer than the other parts, forming a cross of an ordinary shape, the edifice is said to be in the form of a Latin cross. The different open parts usually receive the name of ailes or aisles from a word signifying a wing; the nave or largest open space is called the main aisle. Originally, the floors of all such edifices were open and unencumbered with fixed pews or seats, and, as the floors were ordinarily of mosaic or tesselated pavement, the effect was exceedingly grand.

The roofing of Gothic churches is of stone, in the form of groins, in which the arches are poised with intersecting points, and the whole skilfully adjusted so as to bear on the side rows of pillars. Any high building erected above the roof is called a steeple; if square-topped, it is a tower; if long and acute, a spire; and if short and light, a lantern. Towers of great height in proportion to their diameter are called turrets.

The walls of Gothic churches, on which the outer strain of the roof arches ultimately rests, require to be of great strength;

and the imparting of this necessary degree of resistance without clumsiness is the glory of this style of architecture. The plan adopted is to erect exterior buttresses (Figure 18). These rise by gradations from a broad basis to narrow pointed pinnacles, and, placed opposite the points of pressure, se-

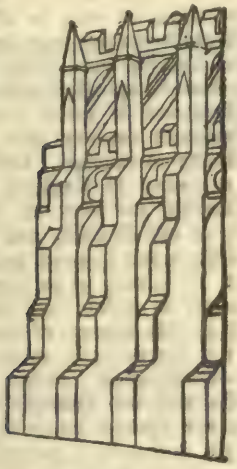


FIG. 18.—Exterior Buttress of a Gothic edifice.

cure, without the slightest appearance of clumsiness, the general stability of the building. Slanting braces, which spring from the buttresses to the upper part of the roof, are called flying buttresses; such, however, are not always required in those modern edifices in which the roof is of wood and lead.

The summit or upper edge of the wall, if straight, is called a parapet; if indented, a battlement. Gothic windows were com-

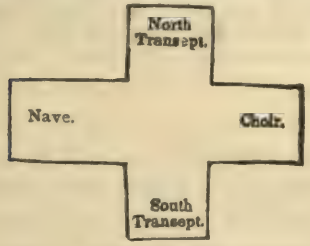


FIG. 19.—Plan of a Gothic Church.

monly crowned with an acute arch; they were long and narrow, or, if wide, were divided into perpendicular lights by mullions. The lateral spaces on the upper and outer side of the arch are spandrelles; and the ornaments in the top, collectively taken, are the tracery. An oriel, or bay window, is a window which projects from the general surface of the wall. A wheel, or rose window, is large and circular. A corbel is a bracket or short projection from a wall, serving to sustain a statue or the springing of an arch. The Gothic term gable indicates the erect end of a roof, and answers to the Grecian pediment, but is more acute.

NORMAN, TUDOR, AND MODERN GOTHIC

Throughout England may be seen many aged castles, some still in a state of good preservation, but the greater number in ruins, and occupying, with their picturesque remains, the summit of a rising ground or rocky precipice. These castles are of a style which prevailed during the feudal ages in Europe, and was taken to that country by the Normans, who erected them as fastnesses, into which they might retire and oppress the country at pleasure.

The feudal castles in England, like those on the Rhine, consisted for the most part of a single strong tower or keep, the walls of which were from six to ten feet thick, and the windows only holes of one or two feet square, placed at irregular intervals. The several floors were built on arches, and the roof was flat or battlemented, with notches in the parapet, from which the inhabitants or retainers of the chieftain might defend themselves with instruments of war. The accommodations for living were generally mean, and what would now be called uncomfortable. Around or in front of the main tower there was usually a courtyard, protected by a high wall, and the arched entrance was carefully secured by a falling gate or portcullis. Outside, there was in many cases a regular wet ditch or fosse. Castles of greater magnitude consisted of two or more towers and inner buildings, including a chapel and offices for domestics, and stables for horses and other animals. Some of them were on a great scale, and possessed considerable grandeur of design.

As society advanced and civil tranquillity was established, these military strengths gradually assumed a character of greater elegance and less the appearance of defence. The wet ditch disappeared, and was superseded by a lawn or shrubbery. Instead of the drawbridge and portcullis, there was a regular approach and a gate of ordinary construction. The windows became larger, and were fitted with glass frames, and stone was abandoned for the greater comfort of wooden floors. Instead, also, of

a bare region around, in which no foe might lurk, gardens were established, and a long avenue of trees led to the front of the modernized mansion. In some instances, the pepper-box turrets at the upper corners of the building remained. Of the class of structures that sprung up in this period of transition, which in England we may refer to the fifteenth and sixteenth, and in Scotland to the seventeenth centuries, there are several highly interesting remains. These edifices of the nobility and gentry were no longer called castles; they took the name of halls, and as such had attained so great a pitch of magnificence in the reigns of Henry VIII and Elizabeth as to have subsequently given a name to a new style—the Tudor or Elizabethan. Latterly, and with no very distinct reference to any particular period, this remarkable fashion of building has been pretty generally called the old English style of architecture. One of the best existing specimens of the Tudor era of architecture is Haddon Hall in Derbyshire, the property of the Duke of Rutland.

MODERN BRITISH ARCHITECTURE

During the sixteenth century, an extraordinary effort was made in Italy to restore the purity of Grecian architecture; and in this attempt Palladio was followed by the not less eminent Michelangelo Buonarotti, who, at an advanced age, in 1546, undertook the continuation of the building of St. Peter's at Rome, a work on which the greatest splendors of the Italian style are lavished. Into England, this revived taste for the Grecian was introduced at the beginning of the seventeenth century by Inigo Jones, to whose contemptuous observations on the German or Pointed Style the term Gothic has been traced; and after his decease, the Grecian, or more properly the Italianized Grecian, was perpetuated on a scale still more extensive by Sir Christopher Wren. The edifices erected by this great master are characterized by the finest taste, and his spires in particular are models of elegance. The greatest work of Wren was St. Paul's Cathedral in London, in which the Italian is seen in all its glory.

The eighteenth century was an era of decline in architectural taste. Every other style merged in that of a spiritless and often mean Græco-Italian, out of which the architects of the nineteenth century have apparently had a difficulty to emerge. Latterly, there has been a revival in England of a purer kind of Grecian, and also, as we have already said, of old English, and the Gothic or Pointed Style, and in most instances with good effect. It is only to be lamented that, by the manner in which state patronage is distributed in this branch of the fine arts, some of the largest and most expensive structures—Buckingham Palace and the National Gallery, for example—have been erected on the poorest conceptions of the Grecian style, and with a general effect far from pleasing. In Paris, there now exist some modern structures after correct Grecian models, which can not be too highly praised; we would, in particular, instance the building called the Madeleine, the Bourse, and the interior of the church of Ste. Geneviève, which are exceedingly worthy of being visited by young and aspiring architects.

Of the superb buildings springing up on all sides of this vast continent, it is unnecessary to speak. Those already in existence, notably in Washington, are admirable copies of the great Greek and Roman periods. The so-called Queen Anne style, which became popular about 1876, soon died out.

STEAM-ENGINES

PROBABLY the most important as well as one of the earliest achievements of modern science was the invention and perfection of the practical steam-engine. This machine operates upon the principle that has been familiar from the ancient times, namely, that gases subjected to heat tend to expand, and, in so doing, to develop a certain force or energy, which, under certain circumstances, can have destructive effects, but, when properly confined and used, become a most efficient prime mover for machinery of all descriptions. Indeed, the fundamental fact demonstrated in all forms of heat engine is that the molecules composing gases, liquids, and solids are so influenced by heat as to be violently forced apart, thus producing expansion or increase in actual bulk, and, at the same time, generating a force or pressure proportionate to the amount of heat actually at work.

Among the earliest attempts to utilize the energy thus developed is found in the primitive contrivance known as the *eolipyle,* which was invented by a certain philosopher named Hero, a citizen of Alexandria, Egypt, about 300 B.C. It consists of a hollow metal ball mounted on trunnions, so as to revolve freely on one diameter, and having on another diameter, at right angles to the first, two tubulures, or bent nozzles, which allow the vapor to escape in opposite directions. When the hollow ball is partially filled with water and subjected to a flame, steam is generated, and, by its escape in two opposite directions through the tubulures, causes the ball to revolve on its axis by reaction of the steam pressure against the air. Such a device as this is, of course, worthless from the point of view of modern mechanics, and it seems strange indeed at the present day that in the thirteenth century a certain Verbrest, a learned Jesuit priest and philosopher, attempted to use an eolipyle to propel a horseless carriage. It is needless to say he was unsuccessful.

The first step toward the steam-engine, as we have it to-day, was made about 1710-11, when Thomas Newcomen of Devonshire, England, invented a steam-actuated mechanism for pumping water from mines, and called it a "fire-engine." It consists of a disk-shaped piston arranged to slide in a hollow cylinder, and transmit its motions under power impulse through

a piston-rod and chain to a walking-beam. His contribution is the cylinder and piston, although, owing to an imperfect understanding of the properties of steam, he arranged to have the real power stroke from the atmospheric pressure, leaving for the steam no more important function than a creation of a vacuum by its condensation. In order to accomplish this result, the bottom of the cylinder was connected to the boiler by a small tube closed by a cock. On opening the cock steam rushed into the cylinder and so far disturbed the balance between the piston and the counterpoise on the piston side of the walking-beam, that the piston was raised and travelled the entire distance to the top of the cylinder; the counterpoise, meantime,

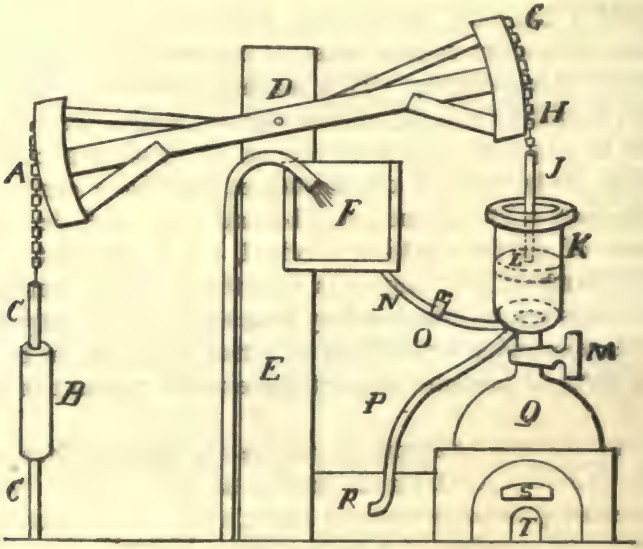


FIG. 1.—Diagram of the Newcomen pumping engine. The cylinder *K* has the sliding piston *L*, which is forced upward by steam admitted from boiler *Q* by cock *M*. By opening cock *O*, water is admitted from the tank *F* through the pipe *N*, and the steam being condensed, producing a vacuum, the resulting water escapes through pipe *P* into the cistern *R*. The piston *L* is then forced downward by atmospheric pressure. The piston is connected by rod *J* and chain *H* to the walking beam *D* at *G*. On the opposite end of the walking beam is the chain *A*, attached to the counterpoise *B* on the pump rod *C C*. The counterpoise acts to make the downstroke of the pump rod when the steam beneath the piston disturbs the equilibrium of the engine, but is raised again when the pressure of the atmosphere acting against the vacuum forces the piston down into the cylinder.

pulling down the pump-rod attached to the walking-beam. This operation was called the "out-door" stroke and furnished the sole condition in which the steam seemed to be used for any dynamic effort. Its power efficiency was limited, however, since it had a pressure of never more than between 2 and 4 pounds to the square inch. The real power stroke was made by taking advantage of the full pressure of the atmosphere, which is approximately 15 pounds to the square inch above a vacuum. This was done as follows: The steam inlet valve was closed by hand and another small cock was opened, admitting water to the clearance space behind the piston and condensing the steam. The effect of condensation was the

creation of a partial vacuum below the piston, which was then forced downward by atmospheric pressure; the condensed water being taken off into a cistern below the level of the furnace. This was called the "in-door" stroke.

For over seventy years from the date of its invention the Newcomen engine enjoyed an undisputed monopoly of its field. Meantime, it was improved in several small particulars, and in 1769 James Watt completed his famous single-acting engine, which marked the limit of its possibilities. In this device Watt retained the counterpoise weight on the pump-rod for the purpose of producing the upward stroke of the engine piston, but, instead of atmospheric air, he used steam to produce the down-stroke, and, most radical departure of all, employed a separate condenser to produce the vacuum instead of injecting water directly into the cylinder space. The use of the separate condenser marked the first recognition of the fact, now a commonplace of steam-engineering, that the cylinder should constantly be maintained at the temperature of the injected steam. In order to achieve this result, while still adhering to Newcomen's principles, he made his cylinder double—one within another—the outer one serving as a steam jacket to maintain the required temperature, although at the same time in communication with the inner cylinder at its top, in order to furnish the necessary pressure for the down-stroke of the piston. Later on, however, he dispensed with the open communication between the steam jacket and the piston sweep, and controlled the inlet of steam by a positively operated valve at the top of the cylinder. The valve motion in both these engines was ingenious and efficient, but, from the fact that extremely low pressures were employed, neither one was what would be called practical at the present day.

Although the Watt single-acting engines were an immense advance on any previous Newcomen models, they shared the primary defect of their predecessors in using only the full volume and pressure of the steam, making no account whatever of the great expansile energy to be obtained and utilized by cutting off the inlet supply before the completion of the power stroke. In the course of elaborate experiments during thirteen years, Watt eventually hit upon this principle, and in 1782 secured a patent covering substantially all the important points of construction and operation that are still included in steam-engines. In his patent specifications he claims as his fundamental improvement the principle of "admitting steam into the cylinder or steam vessel of the engine only during some part or portion of the descent or ascent of the piston, and using the elastic force, wherewith the said steam expands itself . . . as the acting power on the piston through the other parts or portions of the length of the stroke of the said piston."

So far as its essential construction is concerned, the Watt double-acting engine was simply an extension of his first improvement of a separate con-

denser, with the further variation that steam was admitted to both ends of the cylinder, to act on both faces of the piston, and to exert mechanical energy, by virtue of its inherent quality of expansion. However, in spite of these improvements, the Watt engine still continued to operate on the low-pressure principle, the efficient energy being in all cases several pounds per square inch below atmosphere. This result was accomplished, of course, by the use of the condenser producing a vacuum in front of the moving piston, as in the multiple expansion engines of the present day. The valve mechanism was still positively operated from the walking-beam as in his previous models. It was not until early in the nineteenth century that the link motion and eccentric gear, originally invented by a certain Williams of Newcastle, were used for the first time by the Stephensons on one of their locomotives. For this reason the device is commonly credited to Robert Stephenson and is still known as the "Stephenson link motion."

THE THEORY AND CONSTRUCTION OF MODERN STEAM-ENGINES

THE GENERATION OF STEAM

THE first and most important consideration in the construction of modern steam-engines is the generation of steam. In order to operate an engine of given size and power capacity at such a speed as to develop its best efficiency, we must have two things: (1) a sufficient quantity of steam, which means a boiler of sufficient capacity to constantly generate enough steam at a given pressure, under favorable conditions, to supply the requirements of the engines; (2) sufficient heat to continually change into steam the water contained in the boiler. Various rules have been adopted to measure the steam generating capacity of boilers in terms of horsepower—such, for example, as giving 15 square feet of heating surface per horsepower hour. Such rules, however, are largely misleading, since the generative capacity of a boiler, measured in square feet per horsepower, depends very largely upon several considerations: (1) upon the ratio of the heating surface to the outside surface of the boiler, hence to its cubical capacity; (2) upon the shape of the boiler, a horizontal boiler of the "locomotive" type affording a larger exposed surface to the furnace fire than a vertical boiler of ordinary pattern; (3) upon the construction and surface capacity of the furnace, and upon the nature of the fuel used, in respect to ability to develop the requisite number of heat units for vaporizing the water contained in the boiler. The fundamental problem, therefore, in the practical work of designing and constructing steam boilers, is as to what methods and devices are best adapted to the end of increasing the heating surface.

The boilers used with most of the 18th century steam-engines were mere kettles, the water being contained in a large chamber, with an outlet at the top for the steam; the heat being applied only to the exposed bottom and sides of the vessel. The first step in obtaining efficient boilers was made by introducing flues, or tubes carried directly through the water space and allowing so many channels for the escape of burning gases from the furnace into the air above. At first only two or three large flues were used, but later the number was immensely increased, thus correspondingly augmenting the heating surface and the steaming capacity. Another device adopted quite as early as the use of smoke flues was the use of trains or coils of tubes containing water and intended to be directly exposed to the action of the fire. Both types of boilers are in use to the present day and both have their advocates, who argue the superiority of the one type or the other in point of greater heating surface obtained, and consequently of greater steaming capacity. The water-tube boiler is made in a great variety of shapes and patterns; each successive design being intended to serve the

desired end of increasing the heating surface and also of attaining another very desirable object, viz., directing the circulation of the heated water. As is well known, or can be readily verified by ordinary household observation, water when subjected to heat becomes agitated, and small fountains appear upon the surface resembling nothing more perfectly than a spring, where the water gushes out of the ground. The cause of this is that the lower part of the water being heated by the fire beneath tends to rise upward, allowing the cooler layers of water nearer the surface to sink to the bottom, thus producing a regular system of circulation, one stream rising to the surface and others constantly sinking to the bottom. According to the theory of designers of steam boilers, efficiency is very greatly increased by directing the circulation on the lines assumed by nature, as seen in water boiling in an ordinary kitchen kettle, while, at the same time, preventing the ascending and descending streams from interfering. Thus, in water-tube boilers are always found ascending and descending tubes so arranged with relation to the furnace that the heated water always rises through one side and always descends through the other.

BOILER-HEATING SURFACE

The object of increasing the heating surface of a boiler is, of course, to bring the heat into direct contact with the water at as many points as possible. This naturally facilitates the process of steam generation and renders the boiler more efficient. If we have an ordinary kettle or water heater in contact with the flame of a stove, it is evident that the water contained in it may be brought to a boil in a period proportionate to the amount of water and to the heat of the flame—for it is a familiar fact that some substances, liquid, solid and gaseous alike, produce greater heat in burning than others. It is, therefore, evident that, if we wish to make the steam generation more rapid, there are two courses open to us. The first is to increase the heating power of the fire by using some other fuel with a larger heat equivalent. The second is to increase the heating surface so that the heat can come in contact with the water at as many points as possible. We may illustrate this fact as follows: If in a boiler or kettle with a base of 1 square foot area, we introduce a tube running from the bottom of the kettle to the top, the heating surface will be increased by as many square inches as the tube contains in its length. If, for example, the tube has an inside diameter of 2 inches and is 12 inches long the number of square inches contained in it may be found as follows: Multiply 2 inches by 3.14159, which represents the ratio between the diameter and circumference of a circle, and being multiplied by the diameter gives the circumference. The result of multiplying in this case is 6.28318, which represents the inside circumference of the tube. Multiplying this figure by 12, representing the length of the tube in inches, we obtain the figure 75.39816, representing the number of square inches in the tube. In order to reduce the term to square feet we divide by 144, obtaining the result .52359, or approximately one-half of a square foot of heating surface actually added to the vessel in question. It takes very little reflection to see that by thus permitting the heat to come in contact with the water, through an additional surface approximately one-third greater than that originally afforded, the steam-generating capacity and the rapidity of generation are both increased theoretically one-third.

FUELS: HEAT EFFICIENCY

Just as some substances burn more rapidly and generate a greater amount of heat than others, so some require either more heat or longer exposure to a flame to raise their temperature as measured in degrees. This question is largely determined by the heat-conducting capacity of the substances in question. Thus, the majority of substances, liquid or solid, require less heat to raise their temperature through a given number of degrees than does water. For this reason water is taken as the standard of measurement in estimating heat-efficiency. It is evident to any one that it will take a greater quantity of heat—which is to say a larger fire—to raise a teakettle of water to the boiling point than to heat a teacupful to the same temperature, although the fire in both cases may register precisely the same number of degrees on the thermometer or pyrometer. This brings us to the consideration of the practical quantity of heat required for raising a given amount of water to the point at which steam is generated, and hence for exerting a given amount of mechanical power in the engine operated by the steam. The practical unit of heat-quantity recognized by engineers is the so-called *British Thermal Unit* (B.T.U.), which indicates the amount of heat required to raise one pound of pure distilled water through one degree Fahrenheit, from 39.1

degrees, which is the temperature of the maximum density of water. The method of calculating the number of heat units, actually consumed in the process of heating water and generating steam, is, briefly, to estimate the heating efficiency of the fuel per pound, and to determine how much has been used in volatilizing a given amount of water. If, for example, 1 ounce of a given fuel must be burnt in order to raise 1 pound of water through 1 degree Fahrenheit, its heating efficiency is to be estimated at 1 heat unit to the ounce. Therefore, if a certain amount of water requires 10 ounces to raise its entire volume through 1 degree Fahrenheit, it is evident that 10 heat units have been consumed. This heating capacity is, of course, very much lower than that represented by most commercial fuels, which frequently show from several hundred to several thousand heat units to the pound.

HEAT REQUIRED FOR STEAMING

In practically estimating the amount of heat required to volatilize a given quantity of water, it is not correct to assume that only 1 heat unit is required to raise each pound through each degree Fahrenheit from 39.1 to 212. As a matter of fact, a far greater expenditure of heat is actually demanded by the physical properties of water. It is a well-ascertained fact in science that to accomplish the work of changing the physical condition of a substance—as, for example, from the solid into the liquid state or from the liquid into the gaseous—a large amount of heat is absorbed in doing "interior work," which does not become sensible or perceptible, and is not registered by the thermometer, pyrometer, or other instruments. Thus, several hundred heat units are consumed in changing one pound of ice into liquid water, and one-half as many again are absorbed in transforming the water into steam after the sensible temperature of 212 degrees has been obtained. Thus, to convert one pound of water at 32 degrees Fahrenheit into one pound of steam, the following number of heat units would be required: (1) to raise the temperature from the 32 degrees to 212, there are consumed 180.9 heat units; (2) for "interior work" in transforming the liquid into a gaseous state, 894 heat units; (3) to overcome the resistance of the atmospheric pressure, 71.7 heat units—the total being 1146.6 heat units, with a sensible temperature of only 212 degrees Fahrenheit. When we consider that the so-called mechanical equivalent of heat is theoretically supposed to be 778 foot-pounds per heat unit—which is to say, such a power as can move one pound weight through 778 feet or 778 pounds through one foot in each second of time—we may understand the immense amount of energy expended in generating steam. According to this formula, 892,054.8 foot-pounds equivalent in heat units is consumed in changing one pound of water at 32 degrees into steam.

All these matters need to be mentioned only in order to show the exactness of modern engineering measurements. Of course, the mechanical equivalent of the heat actually expended may be calculated only after the steam is generated, and, even then, the full amount of power is never realized in any commercial engine, owing to the numerous causes of loss from radiation, etc., and in maintaining the necessary high temperature in the cylinders. The figures already given illustrate forcibly another point frequently commented on, which is that, even with the best and most economical steam-engines, no more than 15 per cent of the heat actually expended can be used in mechanical work. The remainder is absorbed in doing "interior work" or passes off into the atmosphere. Nor can these causes of waste be overcome; for, since it is necessary that the fire be maintained by a draft, a large amount of heat will inevitably pass up the chimney and be lost for all mechanical effect.

PRESSURE AND EXPANSION

Other conditions involved in the process of generating steam may be briefly expressed as follows: (1) the greater the pressure exerted on the liquid the higher the temperature required to evaporate it; (2) the greater the expansion allowed the steam the smaller the heat required to evaporate it—hence, theoretically, the greater the economy.

To illustrate what is meant by pressure on the water we may state that in a vacuum where most of the air has been exhausted, water may be boiled and evaporated at a temperature as low as that of the human hand, which is 96 degrees Fahrenheit. Inversely, therefore, as we increase the pressure a greater amount of heat is wasted in producing the boiling and steaming of the water. The consequence of this is that to use excessively high pressures is more wasteful in fuel than efficient in power.

The meaning of pressure in connection with steam is briefly as follows: in the process of evaporation the particles of water

are forced apart, not gently and gradually but violently and with great force. To illustrate this we may state that the steam from 1 cubic foot of water would so expand in evaporation as to occupy 1,646 cubic feet of space before its latent heat is exhausted and condensation begins. The whole theory of the practical steam-engine depends upon confining the steam that should naturally occupy several hundred cubic feet into a space, oftentimes less than 1-100 of that volume, Thus, the pressure of the confined vapor increases as the heat that is acting upon the water, and if the walls of the boiler are not sufficiently strong they will be forcibly sundered and an explosion will occur. After the pressure of the confined steam has risen beyond a certain point, expressed in terms of pounds per square foot, the generation of steam proceeds much more slowly, and the steam already generated becomes charged with small particles of unvaporized water. This is what is known as "saturated steam," or wet steam. It has this peculiarity, that, if subjected to additional pressure either from an outside source, or in the cylinder, or simply under the conditions found within the boiler, it tends to condense into the liquid form again.

SEPARATED STEAM

When steam is let out of the boiler into a chamber known as a "separator," it may be subjected to additional heat, becoming what is known as dry, superheated, or separated steam. Steam, thus separated from the water generating it and subjected to heat, assumes several properties of permanent gases, among which may be mentioned the fact that it will not condense into the liquid state under pressure so long as the temperature is not lowered. Another peculiar difference between the two forms of steam is that, while ordinary wet or boiler steam will painfully scald the body coming in contact with it, the heated or dry steam will not produce painful effects.

KINETIC PROPERTY OF STEAM

The principle upon which steam exerts power and moves machinery depends in modern steam-engines entirely upon the expansive pressure exerted as its molecules are forced further apart in the attempt to assume the natural volume. This may be illustrated briefly as follows: If we place a certain amount of water in a closed vessel—say a hollow cylinder—having an air-tight disk, or piston, arranged to slide from end to end in its length, we shall find that as the generation of steam proceeds this disk or cover will be continually forced upward and will be finally thrown off at the top unless an effectual check is provided against its further movement. If, now, a cock be opened at the side of the vessel, so as to allow the steam to escape, the movable disk will tend to sink again under the force of gravity and the pressure of the atmosphere. This is practically the scheme adopted in Newcomen's engine, as we have already seen. In order to utilize the natural pressure of the expanding steam to the best advantage, its generation takes place in one closed vessel, the boiler, and its mechanical energy is exerted in another closed vessel, the cylinder. In both cases, however, the expansive energy of the steam is exerted to push out the movable disk, or piston, until the pressure within the closed vessel is equal to that outside it, or to what is acting on the opposite face of the piston.

THE CYLINDER AND PISTON

As we have already learned in the discussion of the Watt engine, the modern steam cylinder is double-acting. That is to say, by the movement of properly arranged valves, the steam pressure is caused to act alternately on both faces of the piston. In practical operation, as the valve lets in the steam to act upon one face of the piston, another valve allows it to escape from the space in front of the opposite face in the piston; thus, as the pressure is exerted against the piston on the one side, it is constantly reduced on the other.

In acting upon the face of the sliding piston the steam follows the law that its pressure is in inverse ratio to its volume. Thus it is that the steam escaping from one side of the cylinder constantly decreases in pressure as it increases in volume, whereas the steam entering the cylinder at the opposite side retains its pressure and volume so long as there is uninterrupted communication between the boiler and the cylinder.

It is unnecessarily wasteful, however, to maintain the full pressure throughout the entire stroke of the piston, since modern boilers and engines use steam having a pressure at almost any point between 100 and 250 pounds to the square inch, which is to say approximately between 7 and 17 times an atmosphere. Therefore, it is customary to cut off the supply from the boiler at certain definite points, and allow the remainder of the stroke to be made with the expanding energy of the confined steam.

Thus, if steam at a pressure of 150 pounds be cut off at one-half the stroke, the pressure at the end will be 75 pounds because the confined steam has expanded once or doubled its volume; if, with the same initial pressure, the supply be cut off at 1-10 stroke, the pressure at the end will be 15 pounds, because the steam has expanded 10 times, reducing its pressure one-half at each successive expansion. If, in both of these cases, the piston has a surface equal to 144 square inches, or one square foot, and the stroke is 24 inches, or two linear feet, the amount of steam used in each case may be found by multiplying the area of the piston by that portion of the stroke length during which steam was being admitted. Thus in the first case we have $144 \times 12 = 1728$ cubic inches; in the second case, $144 \times 2.4 = 345.6$ cubic inches.

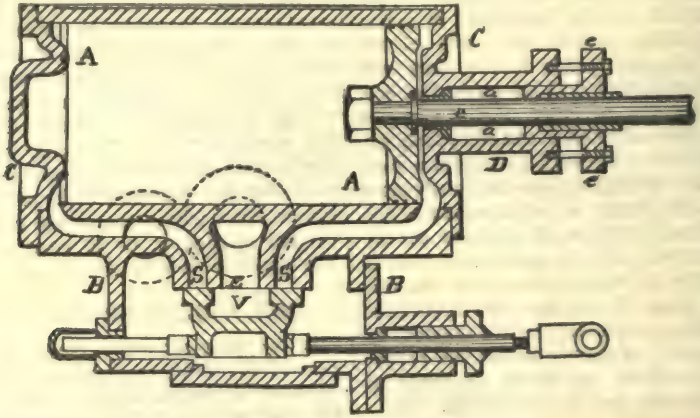


FIG. 2.—The cylinder and valves of a steam-engine. The piston slides in the cylinder *A A*, which is closed at either end by the heads *C C*. The piston rod *c* slides through the stuffing-box *D*, which is closed by the gland *e e*; the space *a a* being packed with soft packing material. Steam is admitted from the steam chest *B B* through the ports *S S*, when the valve *V* is in proper position and is exhausted through *S* into *E*, when the *D*-valve opens communication between *E* and either of the ports *S*. The *D*-valve *V* slides from left to right and back, alternately opening each of the ports *S* into the steam chest *B*, and allowing steam to enter one end of the cylinder clearance.

THE INDICATOR AND DIAGRAMS

In calculating the actual work done in moving the piston of the steam-engine—which is to say, in order to secure a statement of the power or energy expended in terms of foot-pounds or horsepower—it is necessary only to multiply the pressure, in terms of pounds per square inch, by the area of the piston in square inches and by the length of the stroke in linear inches. Since, however, the boiler pressure is cut off at some certain point in the stroke length, as we have already seen, the pressure upon the face of the piston is not the same throughout the entire length of the stroke, nor can it be properly calculated except by very elaborate mathematical processes. It is necessary, therefore, to use the steam-engine's indicator, which contains a small piston of definite area in constant communication with the interior of the engine cylinders, so as to be affected by the varying pressure at all points of the stroke. This small piston is attached to a rod working a gear carrying a pencil at its opposite end. This pencil bears against a card held on a tablet or roll, which moves as the engine piston, thus tracing what is known as the indicator diagram or card. This card may be read by knowing the pressure, as indicated by the gauge, and the point of cut-off.

In the specimen indicator card shown in the accompanying diagram the point of cut-off, and the other parts of the engine cycle, are indicated by lettering. As the reader will understand, all the various lines and curves are made as the result of the varying pressure within the engine cylinder during the stroke, acting upon the small piston of the indicator as already explained. In reading the diagram the usual method is to rule ten vertical equidistant straight lines, beginning at the tallest end of the shoe-shaped figure. Between these vertical lines are ruled ordinates, separating each space

into two equal parts. Then, knowing the admission pressure of the steam, as indicated by the gauge, the proportionate value of each ordinate in pounds per square inch may be readily found by measuring each of them. The ten figures thus found are added together and divided by 10, the result being what is known as the *mean effective pressure* (M.E.P.), which is to say, the average of all pressures at the different stages of the cycle.

Another familiar method of calculating the indicator diagram is to use an instrument called the planimeter. This consists of two arms pivoted together, one being secured to the board or table, the other carrying a tracing point on its free end, a graduated wheel arranged to indicate square

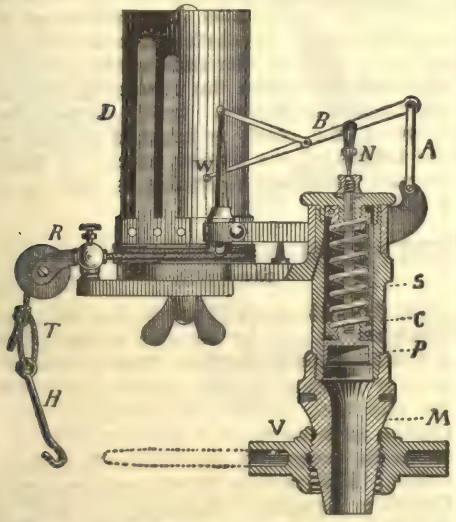


FIG. 3.—The steam-engine indicator. Here *D* is a drum, which is rotated in one direction by the cord *T* wound about it and actuated by lever reducing attachment through hook *H* from the crosshead of the engine. Upon this drum a sheet of paper is wrapped, being held in place by the clips shown. A pencil point at *W* is moved over the face of the paper as the drum rotates, its motion being imparted by arm *B* from point *N*. The steam from the cylinder of the engine enters through tube *M* and acts upon piston *P* in the small cylinder *C*, causing the spring *S* to be depressed, thus, according to the varying pressure, enabling pencil *W* to trace a definite figure on the paper on drum *D*. This is the indicator diagram.

inches and tenths of an inch, and a vernier, to indicate hundredths of an inch. After securing the instrument to the table, the tracing point is moved around the entire outline of the indicator card, and in doing so registers the area in square inches and fractions of an inch contained within the line. For example, we may have the figure 4 on the graduated wheel, with 6 graduations after zero on the vernier, and the figure 5 on the vernier opposite to 4; thus giving the area of the indicated diagram as 4.65 square inches. This figure is then divided by another figure indicating the ex-

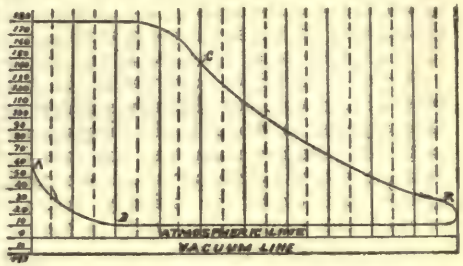


FIG. 4.—An ideal indicator diagram showing the cycle of operations in the steam cylinder. On the admission of steam the pressure rises from point *A*, which is here 60 pounds (compression pressure) to 180 pounds at the top of the right line, thence continuing throughout the admission with but slight decrease in pressure—owing to the closure of the steam ports—to point *C*. Expansion then begins, and continues to point *R*, when the exhaust valve is opened, allowing the pressure to fall rapidly to one atmosphere (14.7 pounds), so continuing to *B* when the exhaust port is closed. The stage of compression then begins; the residual steam in the cylinder being compressed to about 40 pounds per square inch by the advancing piston, until the opening of the steam port, when the same cycle of operations for that end of the cylinder is again begun. In a card taken for both ends of the cylinder the diagram shows two such shoe-shaped figures facing in opposite directions, and indicating the same conditions on each side of the piston.

treme length of the diagram in inches. If, for example, this length be taken as 3.5 inches, the result of the division will be 1.33, which, multiplied by the figure on the spring of the indicator indicating its relative strength or tension, gives the *mean effective pressure* in the cylinder on which the card was made. If in this case the spring be marked 30, the multiplication will give 39.90 pounds per square inch as the *mean effective pressure*.

THE PARTS OF A STEAM-ENGINE

We have thus far learned the theoretical conditions under which steam is used in the modern steam-engine, and may now proceed to a practical discussion of the mechanism used to transform the heat and the expansive pressure into power and motion. The cylinder is closed at both ends by suitable air-tight heads.

Within the length of the bore slides the piston, which is a thick disk of metal; the

contact between its outside circumference and the wall of the cylinder being rendered tight by the use of metal packing rings which can expand with the heat and slide smoothly against the lubricating oil on the inside of the bore. Secured to the piston, and extending through the stuffing box in one of the heads of the cylinder, is the piston rod, by which the movements of the piston under the impulse of the steam are transmitted to the machinery to be operated by the engine.

Steam is admitted alternately to both ends of the cylinder through suitably arranged ports, as shown in the diagram, and exerts its pressure upon first one face and then the other, as the ports are alternately opened and closed by suitably arranged valves. The steam valve, while in position to open the port admitting steam into one end of the cylinder, also opens the exhaust through the port at the opposite end of the cylinder, thus allowing the steam there contained to escape by its own tendency to expand, and by the pressure of the incoming steam against the opposite face of the piston.

THE SLIDE VALVES AND GEAR

The form of valves used on the typical steam-engine are of the variety known as slide valves. This term indicates that the valve is so arranged as to slide on a suitable bed in the length of the cylinder, so as to alternately open the inlet ports, in order to admit steam from the steam chest into either end of the cylinder. At the same time, the valve always keeps the exhaust port closed to the steam in the steam chest, only opening communication with it to the interior as previously explained. It is not necessary in the present treatise to consider any other form of valves than those described and illustrated, although we may mention that other varieties are used on special type and models of steam-engines. For example, a peculiar form of rotary valve is used on the Corliss engine, and mushroom-shaped "poppet," or lifting, valves are usually employed on the engines built for river and ferry steamboats.

The valve gear of the steam-engine is nearly the most important part of its construction, and, in order to permit of changing the point of cut-off and of reversing the movement of the piston, it must be carefully arranged and adjusted. The D-shaped valve sliding in the length of the cylinder is secured to a rod parallel to the piston rod of the engine, and is thus moved always in relation to it by suitable apparatus to be presently described. On the end of the cylinder piston rod is a square metal block known as the cross-head, which is arranged to slide between guides forming a smooth metal trackway to keep its motion perfectly straight and regular. To the cross-head is pivoted the connecting rod, so arranged as to swing, and thus to transform the straight backward-and-forward movement of the piston rod and cross-head into a rotary or circular motion by attachment to the crank on the main shaft. The crank is a piece of machinery that is familiar by its many applications in every-day life. It corresponds to the "handle" by which one turns a coffee mill or grindstone, or by which the up-and-down movement of a sewing-machine pedal is changed into a rotary movement by connection to the large wheel. In many large steam-engines the crank is formed by two parallel metal pieces set at right angles to the shaft and connected together at their further ends by the so-called crank-pin, to which the connecting rod of the engine is pivoted. In the locomotive, however, the crank is attached to one of the spokes of the driving wheel, or more correctly, one of the spokes is used as a crank.

THE ECCENTRICS AND LINK MOTION

On the main shaft of the engine, near the crank and at a point opposite to the cylinder, are set the eccentrics. These consist of circular pieces of metal—wheels, except for the fact that, instead of turning on their centres, each turns on a point midway between its centre and circumference or on a radius. The motion of the eccentrics is, therefore, irregular, forming in fact a "throw," like the crank, so as to transform rotary motion back again into a straight backward-and-forward, or reciprocating, motion. On account of this, the eccentric affords the readiest possible means of moving the steam slide valve. Although some engines operate with a single eccentric, the most usual plan is to use two eccentrics, each transmitting its motion through a circular piece around its circumference called the "strap," and through eccentric rods to either end of an arc-shaped bar, called the "link." The link is arranged so as to be slid in its length over a metal piece known as the link block, which is set upon the end of the sliding valve rod, already mentioned. By sliding the link to various positions with relatjon to the link block, the travel of the valve may be regulated according to desire. Since the two eccentrics, rigid and

turning with the main shaft, as already explained, are set at a relative angle of somewhat over 180 degrees—which means that the longest distance between the pivot and the periphery of one eccentric is almost but not quite opposite to the longest radius of the other eccentric—the movement transmitted to the link through the eccentric rods attached to its two ends describes the outline of a cassinian or flattened figure 8. When, therefore, the link block is at the centre of the link or at the mid-gear, this movement is greatest; the two eccentrics acting about equally upon the travel of the valve, making its backward and forward movements so short that the steam and exhaust ports are not opened. When the link block is at one end of the link, the valve receives its motion from the eccentric whose rod is attached to that end; the movement of the other eccentric having practically no effect upon it. When, however, the link block is slid to the opposite end of the link, the motion of the valve is similarly controlled by the other eccentric; and because this other eccentric is set at over 180 degrees from the first, the motion of the valve, so far as respects the opening of the steam ports, is changed, and, consequently, the motion of the engine is reversed. From this explanation we may see that the valve is either at full gear when the link block is at either end of the link, or at mid-gear, when it is at the centre of the link. The effect of shifting the link block from end to end is to reverse the motion, as just explained; the effect of setting the block at mid-gear is to virtually stop the engine. It is possible, however, to vary the travel of a valve very considerably between full gear and the dead point, so as to change the "lead" of the valve and the point of cut-off, as desired. Thus, when the valve is at full gear the point of cut-off is determined solely by the lap of the valve, which will be presently explained. When, however, the link block and link are set in any relative position midway between full gear and about two-thirds of the distance to mid-gear the travel of the valve is shortened, and, as a consequence, the cut-off occurs much sooner in the stroke with the consequent results (1) of economizing steam, and (2) of reducing the speed of the engine. After passing mid-gear, the short travel of the valve is in a reversed direction, the point of cut-off being gradually delayed, and the power and speed of the engine tending to increase correspondingly.

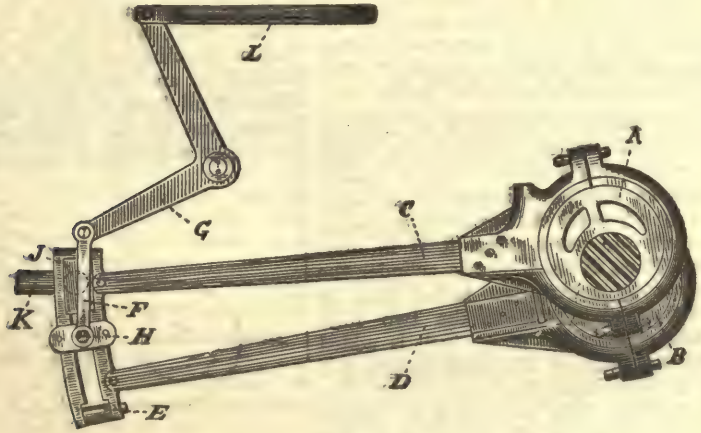


FIG. 5.—Details of the Stephenson link motion as used on types of steam-engine. The eccentrics *A* and *B*, keyed to the main shaft of the engine, are connected through the rods *C* and *D* to either end of the link *E*. The link block *J* attached to the valve rod *K* is arranged to slide in the slot of the link, whenever the link-hanger *F*, actuated by rod *L* through bell-crank *G*, raises the link. The effect of the eccentric motions may thus be varied, and the travel of the valve rod changed, as desired.

"LAP" AND "LEAD" OF SLIDE VALVES

In order to complete a general knowledge of the method of controlling the travel of a valve by use of the eccentric gear, it

will be necessary to explain a few terms. The first and most important considerations in the movement of the valve, and consequently in the determination of the point of cut-off, are the so-called "lap" and "lead." The lap of a valve may be briefly defined as

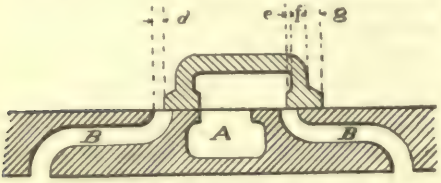


FIG. 6.—Diagram showing the lap and lead of a steam-engine slide valve. The ports *B B* are for admission of steam; *A* for the exhaust from the cylinder. The port *B* at the left is opened by the slide valve so as to allow steam to enter that end of the cylinder from the steam chest. The port *B* at the right is opened into the exhaust *A* by the valve. The space between the lines *c* and *d* shows the lead of the valve; between *e* and *f*, the inside lap, and between *f* and *g*, the outside lap.

any portion added to its length so as to increase that part of the stroke during which the ports are closed to the inlet of steam; the lap being always estimated as an additional length beyond that actually necessary to close all the ports when it is in mid-position. Thus, if on a certain cylinder the valve must be exactly six inches long in order to completely close the two inlet ports, and one-quarter of an inch is added to each end, making the total length 6½ inches, the additional one-quarter inch constitutes the lap. The same term is applied to any extension of the valve over and above what is actually necessary to close the exhaust port from the interior of the cylinder. Thus, when a valve is made longer than need be, either inside or outside, to cover either the inlet or exhaust ports, the extra length is also called lap.

The "lead" of the valve indicates the relative amount of opening of the steam port at the beginning of the stroke. According as this is greater or less, the inlet of steam may be varied and the point of cut-off also determined. There are two ways of altering the lead of the valve: (1) either the lap may be cut down or lengthened, or (2) the stroke-length of the valve may be changed by adjusting the link with relation to the link block, as already explained.

This is perfectly evident on reflection; because if, as previously stated, the lap or additional length given to the slide valve is about ¼ of an inch, it follows that, without such lap the lead will be ¼-inch greater at full gear than when it is used.

ANGULAR ADVANCE OF THE ECCENTRIC

Another consideration of importance in the construction and operation of the valve gear is what is known as the "angular advance of the eccentric," which is to say, the angle through which the eccentric is turned ahead of a position 90 degrees in advance to the crank. Thus, as shown in the accompanying diagram of the main shaft and eccentrics, the throw or longest radius of both eccentrics is set at an angle larger than a right angle with relation to the throw of the crank. The object of this arrangement is to provide for some opening of the inlet ports when the piston is in end position at either end of the cylinder. As a result the dead centre is avoided and one inlet port is opened for the admission of steam from the steam chest, while at the opposite end exhaust is still fully opened, to allow for the escape of any residual steam, and also to prevent all back-pressure above one atmosphere due to the compression of the air. A larger angular advance of the eccentric

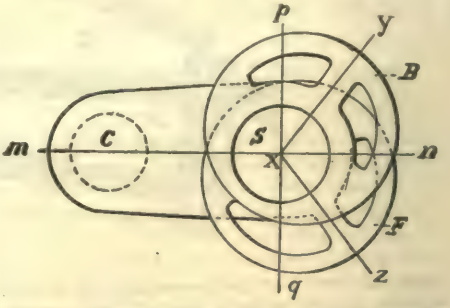


FIG. 7.—Diagram illustrating the angular advance of the eccentrics of a steam-engine. The crank pin is shown at *C*, the main shaft at *S*; the backward eccentric at *B* and the forward eccentric at *F*. The line *m n* is drawn through the centre of the main shaft and crank; the line *p q* is at right angles to it, and the lines *x y* and *x z* show the advance of the eccentric throw from 90 degrees ahead of the crank on the line *m n*.

has the effect of increasing the lead, shortening the admission, lengthening the expansion, and making the exhaust earlier from the exhaust end of the cylinder.

THE COMPRESSION STAGE

While the inlet valve having a certain lead at the beginning of the stroke must necessarily be opened before the piston has reached its end of the cylinder, in completing the stroke under the expansion of the contained steam, the practical construc-

tion of the steam-engine also involves that the exhaust valve is closed at a point somewhat prior to the completion of the exhaust. A certain amount of steam, therefore, remains in the cylinder clearance and is compressed by the advancing piston. Several good results follow from this arrangement, among which we may mention that the compression of the steam by the advancing piston produces a correspondingly high temperature, thus contributing toward the end of heat-economy. It also provides a cushion for the advancing piston, which is useful in avoiding all unnecessary wear and tear on the moving parts, a consideration of very great importance in all engines. Thus, although the admission of steam really begins somewhat before the piston reaches the end of the stroke, at which the crank comes to centre position, the piston, under the impulse of the expanding steam against its opposite face, is able to complete the stroke before one is started in the opposite direction under the impulse of steam at boiler pressure. There are four stages in the cycle of a steam-engine, which is to say the series of effects following on the opening of the inlet at one end of the cylinder. The first is the *admission*, which begins at a point previous to the mid-position of the crank, determined as already seen (*a*) by the amount of lap on the slide valve, (*b*) by the position of the link determining the length of all valve strokes, consequently also the lead, (*c*) by the angular advance of the eccentric. The second stage is the point of *cut-off*, also determined by the construction and adjustment of the valve gears. The third is the *release* or opening of the exhaust. The fourth is the *compression* of the residual steam in the cylinder that did not escape before the exhaust was closed. These four stages are shown in the indicator diagram already explained. Taking such a figure, which has the approximate shape of a shoe, we find that the admission begins at the base of the perpendicular line representing the heel of the figure and extends upward until the point of highest boiler pressure is reached. It then moves in a horizontal direction like the opening of the shoe to the point of cut-off; after which the line, gradually falling toward the toe, represents the expansion of the contained steam. The rapid fall of the line at the point of the toe indicates the opening of the exhaust port which continued along the sole of the shoe—this line indicates the level of atmospheric pressure on all high-pressure engines—until the base line begins to curve upward at the heel. This upward curve is the compression line, and the point where it merges into the admission line is the point where the curve becomes a straight line.

METHODS OF INCREASING EFFICIENCY

In the practical work of designing and building steam-engines the principal object in view is to attain the greatest mechanical efficiency per pound of steam, and to reduce the percentage of loss as much as possible. Of course, as a general proposition, the readiest means for securing economy would seem to be by increasing the initial pressure of the steam; or, in other words, by increasing the heating surface of the boiler. This course, however, involves considerable waste, on account of the great danger of losing energy through lowering the temperature; for, since, as we have seen, the pressure of the steam increases directly with its temperature, lowering the temperature naturally tends to condense it, thus interfering with the proper operation of the engine.

The second and far more practical means of increasing the efficiency of an engine is by lengthening the expansion, rather than by increasing the initial pressure. A moment's reflection will show that the same theoretical result is attained in both cases; for, if we begin with a very high pressure and reduce to atmosphere, we can attain no better result under the usual conditions than by beginning with a moderate pressure—say 200 pounds, corresponding to the temperature of about 400 degrees Fahrenheit—and reduce the pressure through several stages of expansion to a point below atmosphere. This result may be accomplished by the use of a condenser for creating a vacuum before the advancing piston, and, hence, allowing the steam full opportunity to expand to the limit of its mechanical efficiency, which is its absolute pressure or the pressure indicated by the gauge plus the pressure of one atmosphere, which is approximately 15 pounds per square inch.

In order to accomplish this result with the use of a single cylinder would involve a large cubic capacity and consequently continual loss of effective power during the last half of the stroke. It is best, therefore, to arrange the expansion of the steam in several cylinders, as in the triple and quadruple expansion engines used on large steamships and in some stationary plants. According to this arrangement the first, or high-pressure, cylinder is built of compara-

tively small dimensions, with a late cut-off, so that the steam has as great a pressure as possible at the completion of the stroke. It is then exhausted into a second cylinder, whose cubic capacity is considerably greater, and allowed to expand through the larger part of the stroke. Being exhausted the second time from this intermediate cylinder, it is admitted into the low-pressure cylinder, where its pressure is utilized to several pounds below atmosphere by the use of a condenser, which produces a vacuum before the onward-moving face of the piston. The proportionate cubical contents used in practical triple expansion engines differ with designers within certain definite limits. Thus, the intermediate cylinder is generally about ⅓ greater in contents than the low-pressure, and that, in turn, is about ⅓ smaller than the high-pressure. A typical example, taken from the dimensions of the engine on one of the well-known ships of the American navy gives a cubic capacity of 1,843 cubic inches for the first; of 2,742 for the second, and of 4,440 for the third. In calculating the horsepower of a steam-engine the first step is to discover the initial pressure of the steam which is shown by the steam gauge. Since this is estimated in terms of pounds per square inch it follows that the active efficient power operating upon the face of the piston is to be expressed by the product of the gauge pressure and the number of square inches contained on the surface of the piston face. The area of the piston may be found by multiplying the diameter in inches by the constant 3.14159, which represents the ratio between the diameter and circumference of a circle. The third factor in estimating the power of an engine is the length of the piston stroke in feet. If we know the length of the stroke and the number of revolutions of the fly-wheel or shaft in one minute at the highest speed, we may find the number of strokes per minute by multiplying the figure for revolutions by 2. This figure, multiplied by the length of stroke in feet, gives the distance actually traveled by the piston in each minute. The number of foot-pounds available during this same period of time may be found by multiplying this figure by the one expressing the gauge pressure in pounds. The indicated horsepower of the engine may, therefore, be discovered by dividing the figure expressing foot-pounds by 33,000, which indicates the number of foot-pounds per minute in one horsepower.

GAS-ENGINES

ALTHOUGH the development of the steam-engine has been, as we have already seen, one of the most notable and most useful achievements of modern civilization, there are numerous disadvantages attached to even the most perfect models of this type of heat engine. The necessity of using a boiler and the need of constant watchfulness to maintain it, the vast consumption of fuel in comparison with the power actually realized, and the necessary complication of its various parts render it extremely desirable that a simpler and more compact form of motor should be devised. The requirements are partially realized in the modern gas-engine, which is also known as the internal combustion or explosion motor. All three designations for this type of engine are correct and descriptive, although the term explosion motor is usually regarded as somewhat less appropriate than the other two.

THE THEORY AND OPERATION OF GAS-ENGINES

BRIEFLY described, the theory and practical details of a gas-engine include (1) a closed cylinder as in the steam-engine; (2) a piston, single acting, or operated by an impulse upon one face only; (3) a combustion chamber or clearance at the rear end of the cylinder into which a mixture of gas and air is admitted, its explosion at the proper point in the travel of the piston furnishing the power impulse for driving the motor. The gas-engine, therefore, operates somewhat on the principle of a gun, in which the explosion of gunpowder, or some other suitable substance, expels a projectile or bullet from the cylindrical barrel. We may also see the reason for the term internal combustion engine, since the heat necessary to propel the motor is generated within the cylinder itself, instead of involving the use of a furnace, as in the steam-engine. That quite as great a percentage of power may be realized in this manner as with a steam-engine will be shown later. Furthermore, among other sources of economy, we may mention the fact that a gas-engine requires no greater diameter of cylinder or length of stroke to develop a given effective horsepower. The mixture of hydrocarbon gas and air is fired or exploded by an intermittent source of heat, thus doing away entirely with the use of a furnace for burning fuel separate from the cylinder. In fact, if we should take the cylinder and driving gear of a steam-engine and find some means for causing it to generate steam and operate, apart from a boiler, we would have a motor as compact and economical as is found in the ordinary gas-engine.

GAS-ENGINES AND OIL-ENGINES

According to the variety of fuel used in making the explosive mixture, internal com-

bustion motors may be divided into two classes—gas-engines and oil-engines. A gas-engine properly so called is a motor whose fuel is ordinary illuminating gas, natural gas, blast-furnace gas, or a carburetted spirit, such as gasolene or alcohol. A hydrocarbon spirit is said to be *carburetted* when a charge of air is passed through it, or over it, so as to become saturated with the vapor that is given off from it. In oil-engines, properly so called, the fuel is not carburetted or vaporized, but is sprayed directly into the combustion chamber of the motor through an atomizing nozzle, being there mixed with a suitable quantity of air and exploded by some one of the devices to be subsequently explained.

In discussing the use of liquid fuels for internal combustion motors, we may state that all oils and spirits are capable of being volatilized, or transformed into gas at some given temperature, all being ignited and burned at a somewhat higher temperature. This fact holds good for both mineral and organic—which is to say animal or vegetable—oils, as is too well known to require proof. Some oils are more readily volatilized and burned than others. This means that, according to density and other physical and chemical qualities, the various oils have their *flash points*, at which inflammable gas is given off, and their *firing points*, at which they may be ignited and burned, at different temperatures. Thus, although any oil or volatile spirit may be used to propel a gas-engine, some are more suitable than others, from the fact that they may be ignited at lower temperatures and possess a higher heat efficiency.

FUELS: HEAT-EFFICIENCY

The heat efficieney of a fuel, as has been explained in the section on steam-engines, is estimated in terms of thermal units, each one of which represents the amount of heat required to raise one pound of water through one degree Fahrenheit from a temperature of 39.1 degrees. Thus, as given by several authorities, ordinary coal gas develops between 600 and 950 thermal units to the cubit foot; water gas, about 700; acetylene (C_2H_2), 1,670. Benzine develops very nearly 18,450 thermal units to the pound.

PARTS OF A GAS-ENGINE

Understanding these properties of fuels, we may proceed to a practical discussion of the construction and operation of a gas-engine. As shown in the accompanying diagrams, the cylinder of such an engine is opened at the end toward the crank shaft, and is closed at the opposite end, except for inlet ports, which are closed by suitable valves. The piston is of the co-called "trunk" type, consisting of a hollow cylindrical box arranged to slide in the cylinder bore, the spaces between the outside of the piston and the inside of the bore being filled by the use of packing rings as in the steam-engine. Instead of the piston rod and cross-head used in the steam-engine, the connecting rod is pivoted inside of the piston, at the one end, and to the crank on the main shaft at the other. The fly-wheel in a gas-engine is always heavier than would be used with a stationary steam-engine of the same power rating. This is for the purpose of balancing the movement of the motor and compensating for the use of only one power stroke in each two complete revolutions.

TWO-CYCLE AND FOUR-CYCLE ENGINES

While this general description applies to every form of internal combustion motor, there are certain special features rendered necessary by the particular theory of operation to be followed in any case. According to the different theories of operation, there are two varieties of gas-engines—the four-cycle and the two-cycle. The four-cycle engine is the most familiar of the two. According to the theory on which it operates, each cycle, or complete period of operation, is divided into four parts, each represented by a complete stroke of the piston, either inward or outward. The first stroke is outward, being called the *charging stroke*, since, by the outward movement of the piston, the inlet valves are opened by suction, admitting the fuel charge into the combustion space. The second stroke is inward, and is called the *compression stroke*, from the fact that the fuel charge, already admitted into the interior of the cylinder, is compressed before the onward moving piston; its density being increased and its temperature raised accordingly. The third stroke is called the *firing stroke*, because at its beginning, or shortly before the completion of the compression stroke, an electric spark is produced, or some other source of ignition brought into action, thus firing and exploding the compressed fuel charge, and causing the piston to be again driven outward, transmitting its power impulse to the crank and attached machinery. The fourth stroke is another inward stroke, whose use is to

expel the burned gas from the combustion chamber through the exhaust valve, which is opened by geared connections to a cam shaft, or other positively operated mechanism. The burned gas having been expelled, the motor is in condition to begin a new cycle of operations, giving a power stroke for every two revolutions of the main shaft and fly-wheel.

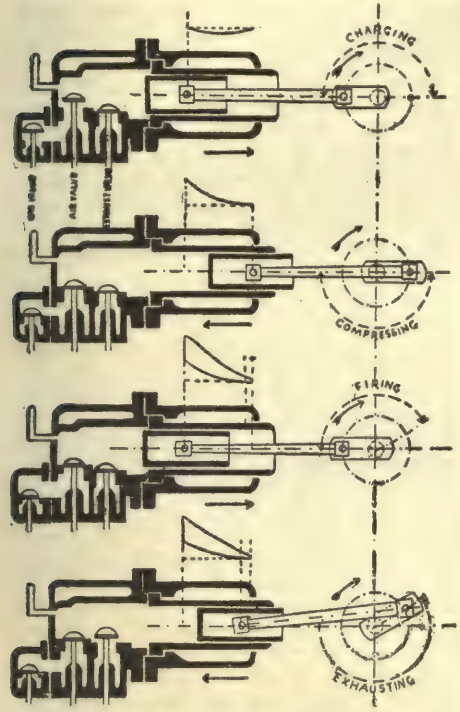


FIG. 1.—Diagrams showing the general construction of a typical gas-engine cylinder, also illustrating the series of operations in a four-stroke cycle. The first figure shows the charging stroke, in which the out-stroke of the piston opens the gas and air valves by suction. The second shows the compression stroke, in which the charge contained within the cylinder is compressed. The third shows the firing stroke, in which the charge is ignited by electric spark or other suitable means, and generates pressure sufficient to drive the piston outward. The fourth is the exhaust stroke, in which the exhaust valves, opened by suitable gearing, allow the burned gases to be forced out by the in-stroke of the piston.

The two-cycle type of gas-engine operates by virtue of certain special constructions; the entire series of operations described in connection with the four-cycle engines being performed in two strokes of the piston, or a single revolution of the fly-wheel. For this purpose, it has the following essential features: (1) An inclosed crank case, as shown in the accompanying diagram, into which the fuel charge is admitted, so as to be compressed by the outward stroke of the piston, instead of by the inward stroke, as with the four-cycle type; (2) inlet and exhaust ports located about midway in the stroke sweep of the piston, so as to be opened when about one-half of the stroke is completed. Thus the gas, compressed in the crank case by the outward stroke of the piston, is forced through a tube opening to the upper end of the cylinder, and assists in the expulsion of the burned gases, which by virtue of their higher temperature expand far more rapidly. The fuel charge is prevented from escaping through the exhaust

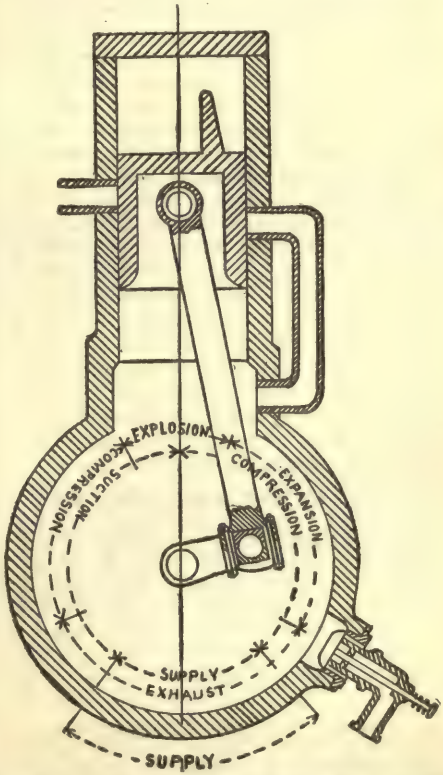


FIG. 2.—Diagrammatic section of the cylinder and crank case of a type of two-cycle gas or gasoline engine. The fuel charge is admitted into the crank or fly-wheel case under suction of the in-stroke of the piston. The stages of the cycle occurring in the cylinder are indicated by the outer circle in the crank case; those taking place in the crank case, by the inner circle. The poppet supply valve is shown in the wall of the crank case; also the inlet and exhaust valves of the cylinder, as explained in the text.

port by a longitudinal flange or screen at the rear end of the piston, which serves to deflect the new gas upward toward the combustion space, so that the exhaust products are always nearer to the exhaust port. When the piston starts on the inward stroke the remainder of the burned gases is expelled through the exhaust port, which is closed later than the inlet port. It also completes the compression of the fuel gases, which is fired at a point approximately on the beginning of the next outward stroke. The economy of the two-cycle engine is thus manifest, since two strokes are able to perform all the functions for which four strokes are required in the other type. Hence, according to theory, it should be able to develop at least twice the power efficiency of the four-cycle type. As a matter of fact, however, according to many authorities, the two-cycle engine can develop only about 60 per cent more power than the four-cycle type, on account of the fact that it can not develop as high a speed. This defect is due to the fact that in the majority of models of this type of engine the combustion space is liable to be choked with a considerable residuum of burned gases, which can not be ignited again and only interfere with the proper operation of the motor. In some of the more improved models of two-cycle engines it is claimed that this defect has been largely overcome. It still holds good, however, as a general objection.

IGNITING THE FUEL CHARGE

The means employed for igniting the fuel charge in the combustion space of the gas-engine cylinder are various. Since the end of firing and exploding the gas requires only a very small quantity of fire, the electric spark is most commonly used for this purpose. With the early Otto engines ignition was accomplished by exposing the charge to the flame of a gas burner, the combustion space being opened at the proper point in the cycle by means of a slide valve. With such a device as this gas-engines could be made with only a very moderate range of speed and power: (1) because the constant opening of the combustion chamber precluded the use of very high compression, hence also, as we shall see later, involving a proportional loss of power effect (2) with high temperature or unusually good speed, the slide valve would become jammed, and work so imperfectly that ignition was frequently prevented. Although the naked flame ignition was used on all gas-engines from 1881 to 1885, the improvement which really rendered them practical primary sources of power lay in the hot tube ignition, probably first devised by Gottlieb Daimler. Briefly described, this device consists in a cylindrical tube, one end of which opens into the combustion space of the cylinder, the other being closed. In order to obtain heat essential to firing the charge in cylinder, this tube is heated to incandescence by the flame of a gas burner playing against it on the outside of the cylinder wall. When heated to incandescence, the fuel charge may be ignited simultaneously with the completion of the compression stroke of the piston; a portion of the gas being forced into the hot tube, where it is set on fire and ignites the remainder of the charge.

A similar device used on several types of engine operates after the engine has taken up its cycle entirely without any external source of heat. Briefly described, this consists of a bottle-shaped chamber connected by a narrow neck with the interior of the cylinder. The oil, or other fuel, is sprayed through an atomizing nozzle into this chamber, which on the first starting of the engine is heated by a torch or gas burner. The explosion of the fuel is produced when atmospheric air, admitted by a separate valve into the combustion space of the cylinder, is forced by the compression stroke into the ignition chamber, thus producing a mixture of gas and air that may be ignited explosively. After the engine has been in operation for a short time the ignition chamber is raised to a high temperature solely by the heat of previous explosions, and the external source of heat is no longer required. This form of ignition, which is known as the hot head system, would be equally efficient for gas or gasolene-engines, although its most general use has heretofore been with oil motors. Another system of ignition making use of the temperature generated by explosion of the gas is found in the famous Diesel motor. Briefly explained, the system employed is as follows: By the suction stroke of the piston pure atmospheric air is drawn into the cylinder. On the return stroke this is compressed into the space of a fraction of an inch, the compression usually amounting to about 550 pounds to the square inch. Such a pressure, of course, raises the temperature to very nearly the point required to ignite an explosive mixture of air and gas. Consequently, when at the moment of beginning the next outward stroke of the piston, a charge of inflammable gas, already compressed in a separate cylinder to a considerably higher pressure, is forced into the

combustion space, there mixing with the compressed air; ignition immediately takes place, and the resulting explosion forces the piston outward.

ELECTRIC SPARK IGNITION

In many respects ignition by electric spark is the most convenient and manageable system of gas-engine ignition. Briefly described, there are two systems in use, the principal variation being found in the fact that a primary spark is employed in the one, and a secondary spark in the other. A primary spark is one derived from some kind of make-and-break device in a circuit between the terminals of a battery, magneto-generator or dynamo. A secondary spark is one occurring in a high-tension circuit—which is to say, after an interrupted primary current has passed through one winding of an induction coil and has induced a high-tension current in the secondary winding. The secondary current, having a much higher voltage or pressure than the primary, is able to jump across a small gap in its circuit, thus producing a very hot and luminous spark. Various devices are employed for breaking the primary circuit at timed intervals, the most usual being a magnetic trembler on the induction coil. The two sides of the secondary circuit are led to the terminals of an insulated plug, each of which ends in a fine point of metal with a minute gap between the two.

One trouble hitherto found with the use of high-tension spark for igniting a gas-engine has been that a deposit of carbonized particles will collect between the terminals of the spark plug, thus preventing the spark from occurring by allowing the current a path of moderately low resistance between the points. A recent device, which entirely overcomes this difficulty, and secures an even stronger spark with a sooted plug, as it is called, consists in what is known as an "outside spark gap," which is only another break in the secondary circuit, the terminal on either side of the gap carrying a metal point or ball, such as is used in producing sparks on the Ruhmkorff coils used in laboratory apparatus, etc. In short, the gap acts as a condenser, the electric energy being piled up on one side or the other alternately, and accumulating such a vastly increased pressure that it is able to leap across the intervening air space, rushing to the terminals of the spark plug with such force and rapidity as to avoid the path through the intervening deposits of soot and giving a spark of great heat and brilliancy.

CYLINDER-COOLING DEVICES

Before proceeding to the theoretical discussion of conditions of gas-engine operation, it will be necessary to explain one other essential element of construction. This is the means employed for cooling the cylinder. While in the steam-engine it is desirable to maintain the temperature of the cylinder at a point as nearly as possible the same as that of the steam, the immensely higher temperature generated in gas-engine operation necessitates the employment of some means for reducing the heat generated by explosion of the charge. When we consider that the heat generated by explosion is very generally greater than that of melted iron or steel—always over 2,500 to 3,000 degrees—we can readily see that the metal of the cylinder must speedily become overheated, and that the oil used for lubricating the sweep of the piston must be burned and carbonized, either event effectually checking the operation of the engine. To prevent these results, therefore, the cylinder is usually water-jacketed, or inclosed within another cylinder, through which water is allowed to circulate, thus carrying off much of the surplus heat. Experience has proved, however, that water maintained at very nearly the boiling point is in the most suitable condition for "cooling" the cylinder. Some gas-engine cylinders, particularly such as are used on light gasolene automobiles, are cooled by means of ribs or flanges cast in the metal on the outside of the cylinder. Such a system of cooling is, of course, far less effective than may be obtained by the use of water—since air absorbs heat far less rapidly than water—and is, therefore, quite impracticable for stationary engines.

ABSOLUTE TEMPERATURE AND PRESSURE

In calculating the operative conditions in a steam-engine, gas-engine, or other form of heat motor, it is customary to use figures expressing the so-called "absolute" pressure and temperature; this means, in both cases, that the recorded figures are increased by constants, which are derived as follows: To the actual pressure as recorded, by the pressure gauge, or steam gauge, it is customary to add 14.7, which expresses the number of pounds per square inch above vacuum exerted by the atmosphere at the level of the sea. To the sensible temperature, as indicated by the thermometer, it is customary to add 460.66, or more usually 461, as expressing the temperature in degrees above abso-

lute zero. The reason for using these absolute figures must be obvious on explanation: since it is necessary to discover the conditions of operation existing within a cylinder of a heat engine we must consider it as existing apart from the conditions obtaining in the outside world. Thus the pressure as recorded by the gauge is always to be understood as having a pressure per square inch above vacuum equal to the figures given by the gauge plus 14.7. This is true because the pressure exerted by the gases in the cylinder against the diaphragm of the gauge must always operate against atmospheric pressure on its opposite face; hence, its absolute pressure is the gauge pressure plus 14.7. In regard to the figures for absolute temperature, we may say they are based upon the demonstrated laws regarding the expansion of gases. Experiment has proved that a gas expands at a ratio of 1-273 part of its volume for each degree Centigrade of temperature increase, which is equivalent to 1-461 per degree Fahrenheit. Thus, the expression for absolute temperature is to be taken as the sum of 461, and the thermometric temperature, or the theoretical total temperature, above absolute zero. This may be readily understood thus: if a gas expands by 1-461 of its volume for each degree of increase in temperature as will explosively ignite 461 below 32 degrees on the Fahrenheit scale. By assuming this temperature we obtain a figure which also indicates the ratio of increase in volume of the gas.

RULES FOR GAS-ENGINE OPERATION

Since a gas-engine operates, as we have already seen, by virtue of such an increase in temperature as will explosively ignite the fuel charge within the cylinder, it follows that the conditions of operation are determined by the increase in pressure and temperature, which is to say, the difference between the initial pressure and the temperature, as found at the start, and the figures for final pressure and temperature, as found on the completion of the cycle. On the basis of precise relation between the temperature and volume of a gas and between its volume and pressure the following rules may be deduced:

(1) The final pressure of the gas is equal to the quotient found by dividing the final volume into the product of the initial pressure by the initial volume.

(2) The final temperature is equal to the quotient found by dividing the initial pressure into the product of the initial temperature by the final pressure.

(3) The final volume is equal to the quotient found by dividing the final pressure into the product of the initial pressure by the initial volume.

Since the initial pressure and the final pressure are shown by the gauge, and the temperature may be discovered by the use of a thermometer or pyrometer, the conditions of operation in a gas-engine cylinder may be accurately calculated from an indicator diagram precisely as in the steam-engine.

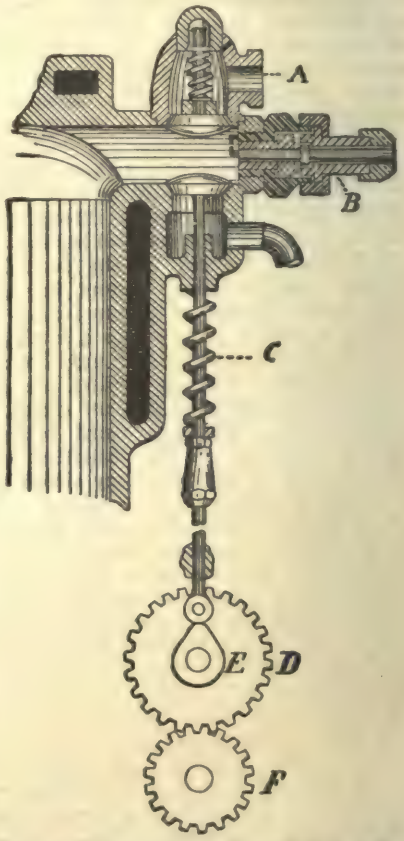


FIG. 3.—Valves and valve gear of a type of gas or gasoline engine. The inlet valve *A* is opened by the suction of the outward-moving piston. The exhaust valve is opened by the rod *C* working against the spring, being lifted by the cam *E* on the shaft of the gear-wheel D. The gear *D* is turned by the gear *F*, which is on the shaft of the fly-wheel and crank. Gears *D* and *F* are here shown in position at right angles to their shafts for sake of clearness. The jump spark plug *B* shows the two sparking points, one on the insulated core, the other in connection with the metal of the cylinder.

THE INITIAL PRESSURE

Since the fuel charge is admitted into the cylinder through a valve normally closed by a spring, it follows that the suction force of the piston is largely expended in overcoming the tension of this spring. Therefore, the fuel mixture admitted to the cylinder at the end of the suction stroke has a pressure somewhat lower than atmosphere—it is generally between 13.2 and 13.5 pounds per square inch. This fact is indicated in the diagram by the position of the suction line. On the compression stroke of the piston, the inlet valves being closed, the fuel within the cylinder is compressed to a point proportionate to the ratio between the length of the combustion space, or clearance behind the piston at in-stroke, and the length of the piston sweep. By either increasing the stroke-sweep of the piston or by decreasing the clearance, the ratio of compression is proportionately enlarged. The rule usually followed for calculating the compression pressure, as obtained in a given cylinder, is to divide the sum of the proportionate figures for clearance and stroke by the figure for clearance. Thus, if the clearance is to the stroke as 2 is to 4, we divide their sum, which is 6 by 2, obtaining 3 as the expression for the compression ratio. Therefore, multiplying the internal pressure by 3, we obtain the compression pressure of this engine. This may also be shown on the indicator diagram, in which, as with the steam-engine, the varying pressures are relative to the tension of the spring used in the indicator. Thus, if the initial pressure is 13.2, the compression pressure in an engine with a ratio of 3 will be 39.6. It has been ascertained that, within certain limits at least, an increase in compression pressure, attained by the means already indicated, involves correspondingly good economy in the use of fuel by proportionately increasing the pressure generated by explosion. The explosion of the fuel charge, at about the completion of the compression stroke, raises a temperature to a point between 3 and 4 times that of the compression temperature, increasing the pressure about the same figures. This fact is indicated in the diagram by a vertical line, showing the sudden increase of pressure against the spring of the indicator. From the highest point of the explosion line, the pressure is seen to drop rapidly at first, more gradually afterward, until the point at which the exhaust valve is opened by the operation of the cam shaft and gears. The pressure then drops suddenly to a point below atmosphere, on account of the high temperature and great active pressure of the escaping exhaust gas.

THE INDICATOR DIAGRAM

The gas-engine indicator diagram may be calculated in the same manner as that already explained for the steam-engine diagram—either by the use of a planimeter or by ruled ordinates. This process enables the finding of figures expressing the mean effective pressure, or the average of all the pressures exerted throughout the stroke.

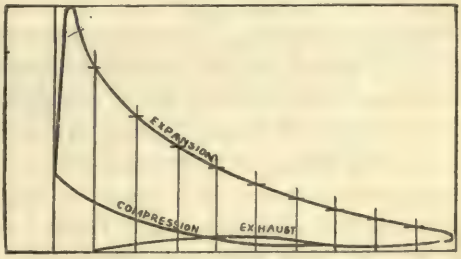


FIG. 4.—Typical gas-engine indicator card. This is drawn in the same manner as the steam-engine diagram. The inlet and exhaust curve is shown at the bottom of the figure; the compression line, from the toe to the heel; the explosion line at the left side straight upward; the expansion line, from the point of highest temperature and pressure to the toe of the diagram. The exhaust is opened just before the toe is reached, and the rapid fall of pressure resulting begins before the exhausting in-stroke.

Having found the mean effective pressure, it is possible to calculate the horsepower of the engine. This may be expressed as the quotient found by dividing 33,000—which indicates the number of foot-pounds per minute per horsepower—into the product found by multiplying the figure for mean effective pressure by the piston area in square inches, by the length of the stroke in feet, and by the number of explosions per minute.

FIRST PRINCIPLES OF ELECTRICITY

THE word electricity is derived from the Greek word *elektron,* meaning amber; the reason being that the first manifestations of this form of energy observed by the ancients consisted simply in the familiar experiment with what we now call electrophorus. The apparatus consists of a plate of rosin or other hard gum, which may be "electrified" by rubbing with a silk cloth so that the energy produced will cause small fragments of paper, etc., to be attracted to the gum or amber disk, like iron filings to a magnet. The same phenomenon having been originally observed with the use of amber—which is fossilized gum—gave the first clew to the existence of the mighty force which now is harnessed to drive our railroad cars or light our streets and to perform a multitude of other useful services.

Nearly the most important phase of electric manifestation is that known as magnetism, and here also we have an interesting example of a force imperfectly understood and named by the ancients. The word magnet is derived from the name Magnesia, a place in Asia Minor, where there were deposits of the so-called magnetite iron ore which has the peculiar property of attracting iron particles just as the electrified iron bar. Fragments of this ore were therefore called magnets or magnesian stones. The exceedingly rudimentary knowledge of electricity and magnetism as understood by the ancients continued with extremely small additions—among which may be mentioned the invention of such devices as the Leyden jar or condenser and the Von Guericke electric machine—until within less than one hundred years. The first of the great electric achievements of the nineteenth century was the discovery of the electro-magnet by Professor Joseph Henry in 1830. Upon this device was based the electric telegraph of Morse, and later nearly every other great achievement in this branch of physics and industry. Only within the last thirty years has the mechanical production of electrical energy by the use of the dynamo electrical generator made possible the generation of currents sufficiently strong to move heavy machinery and perform the manifold functions for which electrical energy is now employed.

The first experimental dynamo was invented by Faraday in 1831. He discovered that, if a copper disk be rotated between the poles of a magnet, a current will move between its spindle and periphery, and over a wire circuit between brushes at these two points.

THE THEORY AND APPLICATION OF ELECTRICITY

ACCORDING to the accepted theory of physicists, the word electricity designates a state or condition of material substance just as does the word heat. In fact, there are many points of analogy between these two forms of physical condition. Heat, as we have seen in connection with the discussion of steam and gas engines, can be transformed into mechanical energy. It can also be manifested as light in the forms of fire and incandescence. Similar manifestations with both heat and electricity actually give birth to forms of energy, which, according to the modern doctrine of the correlation of forces, may be transformed into any and every other form. Thus, as physicists tell us, all energy is molecular vibration, which within the limits of certain frequencies is manifested as sound, and in higher frequencies as light. Thus, audible sounds are said to range between about 32 vibrations per second and about 32,000 vibrations per second, or 15 octaves. Between the highest audible sound and the faintest visible light, which is on the edge of the red color of the solar spectrum, there are, according to the best recognized calculations, at least 35 octaves of vibration, which represent forms of the fundamental force of nature that may be perceived by no sense possessed by man.

GENERATION OF ELECTRICITY

Just as heat results when certain physical conditions are complied with, so electricity follows with certain others. The conditions for the generation of heat are perfectly familiar to every one—they are combustion, or oxidation, friction, and several forms of chemical activity. Practically the same general conditions result in the generation of electricity, which may be discriminated according to the nature of sources producing it, as chemical, frictional, and magnetic—the latter being due to certain forms of molecular change. According to the form of manifestation there are three kinds of electrical energy: static, current, and induced, or electro-magnetic. Current electricity may be either direct, when the current moves constantly in one direction, like a stream of water; alternating, when the current moves, first in one direction and then in the other; polyphase, when several distinct currents on one circuit arise and alternate, each at its own intervals. The distinctions made between all these various forms of electrical manifestation are rather accidental than real; since there is no actual difference between the electrical energy derived from a chemical battery or from a dynamo generator; neither are the various forms of manifestation we have noted so distinct but what the one may, under proper circumstances, be transformed into the other. Thus the chemical cell gives forth a direct current, which by the use of a commutator may be rendered alternating or polyphase. Also, a dynamo may be wound and otherwise adjusted to give forth any form of current that may be desired.

STATIC AND CURRENT ELECTRICITY

While static electricity is of very small importance in modern electrical science—although it was until the beginning of the 19th century about the only form of electrical energy really understood—the conditions of its manifestations illustrate several of the most important laws of electrical energy. To express it briefly, any substance in a negative or non-electrical condition may be charged or electrified by being brought in contact with a primary source of electrical energy. Thus, as is perfectly familiar, amber, glass, or resin may be rubbed with a silk rag so as to give off a distinct shock or discharge to the human body, a piece of metal or other suitable substance. The fact of the shock or discharge illustrates a fundamental principle, which is that electrical energy always flows from a point of high potential, as it is called, to one of low, or relatively negative, potential; just as water always flows from a higher point to a lower under the impulse of gravity. When the drop or discharge takes place suddenly, and then ceases altogether, it is a manifestation of static electrifaction due to the fact that there is a tendency between electrified substances to come to the same degree of potential, just as a hot substance brought in contact with a cold substance gives off enough of its heat to equalize the temperatures between the two. When, however, the flow of electrical energy is constant, we have the manifestation known as current—the fundamental difference being that the supply of electrical energy is constant, instead of being temporary and static. An electrical current is, therefore, a con-

tinual flow of energy from a point of high or positive potential to one of low or negative potential.

BATTERIES AND CIRCUITS

Having understood the facts mentioned in the foregoing paragraphs we can readily understand the series of operations taking place in the ordinary galvanic or chemical cell. The typical and original form of this apparatus consists of a jar or dish, within which are a plate of copper and a plate of zinc. When the jar is filled with a solution of sulphuric acid in water, and the two metal plates are connected outside the solution by a wire, an electric current will immediately begin to flow through this wire. If the wire is cut or broken the current immediately ceases. The operations taking place when the current is flowing on the wire may be briefly described as follows: The sulphuric acid attacks the zinc plate, causing it to waste precisely as combustion or burning wastes wood, paper, etc., changing its chemical constitution. In the galvanic cell electricity is produced by this chemical process, just as heat is produced by the other chemical process of combustion. Again, just as a heated body will give off its heat to one of lower temperature, so the zinc plate, in process of consumption, gives off its electricity to the copper plate, which is therefore, continually being charged through the solution in the cell, so long as the zinc plate lasts. The copper plate having a higher natural potential than the zinc, constantly discharges over the outside wire circuit in its effort to electrify that part of the zinc plate that is not attacked by the chemical solution. Thus, there are two distinct paths for the electrical energy; the first from the zinc, through the solution of acid to the copper, the second from the copper through the outside wire back to the zinc. This shows that electrical energy always moves in a closed path, which is known as a circuit, and if any body or machine is to be affected by the current generated in the cell it must be included in the circuit of the outside wire, so that the current may pass in at one side and out at the other back to the cell. This principle of the circuit is fundamental in electrical science.

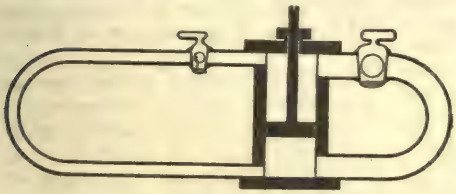
ELECTROMOTIVE FORCE (E.M.F.)

Although popular habit persists in describing the activity on the wire of a circuit as electricity—speaking of a "current of electricity," etc.—this term is not strictly correct. The fact of the matter is that the current is rather the *effect* of the electrical condition at the source, just as heat in a flame gives rise to certain definite effects. As we have already learned in connection with the steam-engine, the effects of heat—the number of heat units generated, and the power of raising given amounts of water to the boiling point—depend not so much upon the sensible temperature as upon the bulk of the matter in combustion. Thus the flame of an alcohol lamp and the fire of a furnace may register the same temperature on the thermometer or pyrometer, yet the latter can in a short time raise the water in a great boiler to the steaming point; while the former can do no more than heat the water in a small kettle. The difference between the two sources of heat is in their mechanical equivalences, which is estimated in terms of thermal units, as already explained. Similarly, two electrical sources differ in the amount of activity—and all other effects—that they can set up upon a given circuit. The mechanical equivalents of their electrical conditions vary as their *electromotive force* (E.M.F.), which is estimated in terms of electrical pressure, or voltage. Furthermore, just as the mechanical equivalence of a given source of heat depends upon the *amount* of fuel in the state of combustion, so the E.M.F. of two chemical batteries or electrical sources differ as the area of the positive element, or zinc electrode. Thus, as we shall see later, if several chemical cells be *properly* connected up into a battery, the pressure of the combination is equal to the sum of the individual cell pressures. The same rule regarding the connecting-up of several generating units applies also to the operation of dynamo electric machines on circuits; although the voltage of a dynamo depends, of course, upon other and different considerations.

THE ELECTRIC CURRENT

The pressure, voltage, or potential of an electrical source—for all three terms properly describe the same quantity—is the moving cause for setting up the form of activity on a circuit, known as "current." The strength or *intensity* of the current depends upon two things: (*a*) the pressure of the source, (*b*) the resistance of the conductor, which is to say the wire of the circuit. The matter of resistance is nearly the most important consideration in the practical operation of electrical apparatus of all descriptions. Briefly described, it

is the property possessed by conductors of *resisting* the flow of electrical current, or of reducing its activity or intensity. In this respect, electrical circuit resistance has frequently been compared with the resistance of pipes and conduits to the flow of water. Take a tank of water at a certain height above the ground—for the pressure of water per unit of area depends upon the height from which it is drawn—and lead from it two pipes, one of them half the diameter of the other. It will be evident that the column of water in the larger pipe will have twice the mechanical efficiency of that in the smaller. Again, take two pipes connected to the head and foot of a pump barrel; both so proportioned as to contain precisely the same amount of water. If, now, we arrange the two so as to be closed at the ends by stopcocks, and pump water through the one, and then through the other, we shall find that a greater expenditure of strength is required to force the water through the long, narrow tube than



Electrical and Hydraulic Resistance.

to force it though the short, wide tube. In precisely similar fashion a small, long wire of copper or other metal offers a greater resistance to the passage of current than a thick and short one of the same metal, although both wires may contain precisely the same amount of matter by actual weight. The precise degree of resistance differs for the various metals, however, as will be presently explained.

Another analogy may be found for the resistance of electrical conductors. Just as we have seen in the article on steam-engines, that the power of a source of heat to evaporate the water in a boiler depends upon the *heating surface* of the boiler; so the power of an electrical source to produce electrical effects on a circuit depends upon what, for want of a better term, we may call the "charging surface" of the conductor per unit of length. The two conditions are even more analogous than might at first appear; for, since the effect of heat, on the one hand, is to produce certain molecular activities in the water, so the effect of electrical pressure, on the other hand, is to produce activity in the substance known to physicists as "ether." In reality, according to some theories, the electrical current is due to etheric activity. Consequently, when the conductor, on account of its larger diameter, presents a greater surface per unit of length for the electrical excitation of the ether, a greater intensity of current is the result.

ELECTRICAL RESISTANCE

The laws of electrical resistance are very definite, and may be summed up in a few brief principles. Thus, for wires of the same metal, the following rules hold good, provided the metal is in no case alloyed or adulterated with other substances:

(1) The resistance is in inverse ratio to the cross sectional area and in direct ratio to the length of the wire.

(2) It follows, therefore, that halving the cross-section of the wire doubles the resistance, and that doubling the cross-section halves the resistance.

(3) Also, halving the length of the wire halves the resistance; doubling the length of the wire doubles the resistance.

OHM'S LAW OF THE CIRCUIT

Having explained the matter of resistance, it is in place to state the laws of electrical manifestation on a circuit. As we have seen in the article on steam-engines, the evaporation of a given quantity of water may be hastened, either (1) by increasing the actual heat to which it is exposed, or (2) by increasing the area of the surface exposed to the fire. In electrical circuits in precisely similar fashion the fundamental principle holds good that:

The current is in direct proportion to the electromotive force (E.M.F.), and in inverse proportion to the resistance.

This statement, which is known to electrical science as "Ohm's Law," involves two very evident corollaries:

(1) The resistance varies directly with the electromotive force, and inversely with the current.

(2) The electromotive force (E.M.F.) varies directly with both the current and the resistance.

THE C.G.S. UNITS

In order to make the application of this law perfectly clear, it will be necessary to digress briefly to define the several units of electrical measurement. Since current

on a conductor *is in motion*, and since it varies in activity or intensity, as we have already seen, it follows that its power to produce given dynamic effects in given periods of time varies directly with this intensity. There are three elements to be considered, therefore: space, time, and weight. This means that current is measured according to its power to move—by any electrical means—a given weight, through a given space in a given time. We take as the unit of space the *centimetre;* as the unit of weight the *gramme;* as the unit of time the *second*. This gives us as the fundamental unit of electrical activity the so-called *dyne*, or C.G.S. (Centimetre-Gramme-Second) unit, which represents such a power as can move one gramme weight through one centimetre of length in one second of time. All the practical units of electrical measurement are stated in terms of this minute quantity.

ELECTRICAL UNITS

The practical units of electrical science are (1) the *ohm*, the unit of resistance; (2) the *volt*, the unit of electromotive force; (3) the *ampère*, the unit of current.

As at present universally accepted, the *ohm* is equal to the amount of resistance offered to the electric current by a column of liquid mercury 106.3 centimetres (about 41.3 inches) in length, and one square millimetre (.00155 square inch) cross-sectional area at the temperature of melting ice (39.1° Fahrenheit). The item of temperature is important, since the resistance of conductors increases and decreases with the temperature, and, as a consequence, may be greater or less as the atmosphere is warmer or colder. To be more precise, the ohm is approximately equivalent to the resistance of *one foot* of No. 40 B. & S. gauge wire, which is about 3-1,000ths of an inch in diameter. Stated in dynamic terms, it is equivalent to such a power as would oppose the electrical current with the force of 10^9 or 1,000,000,000 C.G.S. units.

The unit of current intensity is called the *ampère*, which is defined as such a strength of current as can deposit 33-10,000ths (.0033) of a gramme of copper, or 1118-100,000ths of a gramme of silver per second by the process of electroplating, when the solution or electrolyte in the plating tank is mixed according to the standard recipe. Stated in dynamic terms, it is equivalent to one-tenth (10^{-1} or 0.1) C.G.S. unit.

The *volt*, the unit of electrical pressure, is approximately equivalent to the E.M.F. of several common chemical cells. Thus, the Daniell "blue-stone" cell of ordinary size has a voltage of about 1.08 volts, while the Leclanché cell registers 1½ (1.5) volts, and the standard Clark cell, about 1.43 volts at 15° Centigrade (59° Fahrenheit) of temperature. Stated in dynamic terms, the volt is equivalent to 100,000,000 (or 10^8) C.G.S. units.

PRACTICAL CALCULATIONS

In practical electrical work the theoretical descriptions of the several units of measurement are of small importance: (1) because the voltage of most commercial cells is specified, the resistance of the several sizes of wire of various metals is given in wiring tables, and the current intensity may be measured by efficient instruments. Suffice it to say that one *volt* of E.M.F. will give one *ampère* of current on a circuit of one *ohm* resistance. Since, therefore, two of the three quantities are always known in every electrical circuit, the other may be readily determined by the following rules, which make practical applications of Ohm's Law:

(1) The current is equal to the electromotive force divided by the resistance.

(2) The resistance is equal to the electromotive force divided by the current.

(3) The electromotive force is equal to the current multiplied by the resistance.

In mathematical terms, these rules are applied as follows:

(1) $\text{Current} = \frac{\text{E.M.F.}}{\text{Resistance}}$ or $\text{Ampère} = \frac{\text{Volt}}{\text{Ohm.}}$

(2) $\text{Resistance} = \frac{\text{E.M.F.}}{\text{Current}}$ or $\text{Ohm} = \frac{\text{Volt}}{\text{Ampère}}$

(3) E.M.F. = Current × Resistance, or Volt = Ampère × Ohm.

Stated in terms of C.G.S. units, these processes are verified thus:

(1) $0.1 = \frac{100{,}000{,}000}{1{,}000{,}000{,}000}$

(2) $1{,}000{,}000{,}000 = \frac{100{,}000{,}000}{.1}$

(3) $100{,}000{,}000 = .1 \times 1{,}000{,}000{,}000.$

Thus, if we have a circuit in which the E.M.F. is 10 volts and the resistance 5 volts, the current will be found as follows:

$$\frac{10 \text{ volts}}{5 \text{ ohms}} = 2 \text{ ampères.}$$

If, in another circuit, we know the E.M.F.

to be 50 volts and the current 10 ampères, we may find the resistance thus:

$$\frac{50 \text{ volts}}{10 \text{ ampères}} = 5 \text{ ohms.}$$

If, in a third circuit, we know that the current is 10 ampères and the resistance 6 ohms, we may find the voltage of the battery thus:

10 ampères × 6 ohms = 60 volts.

These rules and processes are fundamental in all calculations for direct (or uni-directional) current circuits, and, by observing all specified conditions, very exact results may be obtained.

UNITS OF WORK AND POWER

Regarding the further units of electrical measurement, we may state that they are: the *coulomb*, the unit of quantity; the *watt*, the unit of power, and the *joule*, the unit of work.

Since the *ampère* expresses the continuous strength or intensity of the current, it remains steadily the same, so long as the conditions of the circuit are maintained. It is not possible, then, to state electrical quantity in terms of ampères per hour, since 10 ampères in a second are 10 ampères in an hour, or a 10-ampère-hour current, if such be the capacity of the battery. We have, therefore, the ampère-second, under the name of the *coulomb*, as the unit of electrical quantity. This is the product of the current in ampères by the number of seconds in which it has been flowing. Thus, with a current of 10 ampères, we have 600 coulombs per minute and 3,600 per hour. The coulomb indicates, therefore, the amount of current-producing element consumed—since this is so much per ampère per second—and is a good analogue of the thermal unit, by which the consumption of fuel may be estimated by the performance of a given engine.

POWER ESTIMATES

In estimating the power expended on a given electrical circuit, we must have recourse to another unit, the *watt*. This is really the *volt-ampère*, or the product of the figures expressing E.M.F. and current. Power is necessarily expressed in these terms, since, although a given intensity of current may produce a given effect with one voltage on one circuit, we have no clew to the reason why the same ampèrage can perform a greater amount of work on another circuit, unless it is by reason of a greater volume or pressure at the source. The analogy of the steam-engine again applies; for a given small engine may be run at say 100 pounds pressure to the square inch of piston area, by a boiler that could not possibly generate steam enough to run another larger engine at 1-100th of that pressure. Thus, although a certain railroad locomotive and a certain steam automobile may be run at precisely the same pressure in pounds per square inch, the automobile boiler could not possibly generate sufficient steam to even move the wheels of the locomotive. In brief, it is just another example of our former figure of the alcohol lamp and the engine furnace: the difference in effectiveness between two engines, or other prime movers, is in the amount of power exerted per second—the amount of steam or current generated at the source. Thus, in calculating the power of an electrical circuit, we take into consideration the resistance operating to reduce the effect, when we multiply the voltage by the effective current. In one circuit, for example, we might have a volume or pressure of 1,000 volts and a current of 15 ampères, while on another we would have 300 volts at 50 ampères. Owing to the evident difference in resistance, which, as we have seen, immensely reduces the electrical energy on a circuit—the resistance is, according to Ohm's Law, 66.66 ohms on the first circuit and only 6 ohms on the second—we find that the effective power is the same in both, 15,000 watts.

The effective power on a circuit in watts may also be calculated as the product of the square of the current by the resistance; also, as the quotient between the square of the voltage and the resistance. Thus, for the second circuit named above, we have: $6 \times 2{,}500 = 15{,}000$ and $90{,}000 \div 6 = 15{,}000$. Here, 2,500 is of course the *square* of 50 (or 50×50), and 90,000, the square of 300 (or 300×300).

In order to obtain an idea of the exact power with which we are dealing, we may say that approximately 746 watts make one electrical horsepower. Since, therefore, one horsepower is equal to 33,000 foot-pounds per minute, or 550 foot-pounds per second, one watt is the quotient resulting from dividing 746 into 550, which is somewhat over ¾ foot-pound in each second.

When a current power of one watt is continuously exerted during the period of one hour, we have one watt-hour, as the expression for the energy expended. In order to find the equivalent of the watt-hour in terms of work actually done, we must take the product of the watts (volts × ampères) and the number of seconds,

3,600. This gives the answer in *joules*. For a circuit giving a power of 15,000 watts, we have, accordingly, in one hour 15,000 watt-hours, or 54,000,000 joules. This represents somewhat over 20 horsepower constantly exerted through one hour.

LARGE AND SMALL UNITS

Since electrical calculations vary between immensely large and immensely small quantities, it is necessary to have expressions for parts and multiples of the various units that will admit of expressing these with the fewest possible figures. Accordingly, we have terms borrowed from the metric system, as follows:

1 kilowatt = 1,000 watts
1 millivolt = .001 volt
1 milliampère = .001 ampère.

Other terms have the prefixes *meg* and *micro* (Greek *megas*, large; *mikros*, small), expressing, respectively, 1,000,000 units or $\frac{1}{1,000,000}$ unit. Thus:

1 megohm = 1,000,000 ohms
1 microhm = .000,001 ohm

SPECIFIC RESISTANCE

On the matter of what is known as specific resistance, or "resistivity," there is a vast difference between various substances. Of course, in order to measure the resistivity of several substances, portions as nearly as possible of the same dimensions of each one in turn must be used for the experiment. Thus, in the succeeding table, the unit dimension chosen is one cubic centimetre. A common temperature is also necessary, since the conductivity of a substance increases inversely with the temperature. That is to say, the colder the substance, the smaller its resistance, and the warmer the substance, the greater its resistance. Experiments are best conducted, therefore, at the zero of temperature. The table also gives the figures for conductivity of the several substances—that is to say, the power of conducting current as compared with that of resisting it.

Substance.	Relative conductivity. At zero, Centigrade.	Specific resistance in microhms per cubic cm.
Pure silver	100.00	1.521
Refined copper	99.90	1.603
Pure gold	86.65	2.077
Aluminium (99.5)	63.09	2.889
Swedish iron	16.00	9.500
Platinum	10.60	8.982
Lead	8.88	19.630
German silver	7.70	20.760
Mercury	1.60	90.74
Graphite	0.07...2,000 to	42,000

In general, the metals are the best conductors of current; most other substances, both liquid and solid, being far inferior in this quality. Speaking exactly, however, all substances conduct current in some degree. Even those called "insulators" or "dielectrics" owe their power to practically cut off or confine the current to the fact that their resistivity is so immense that the amount of current passing through them is correspondingly minute. Their resistivity, therefore, instead of being measured in *microhms* must be stated in *megohms* per cubic centimetre. The following table gives the resistivity in megohms per cubic centimetre of familiar insulators.

Substance.	Resistivity.	
Mica	84,000,000	megohms
Glass	91,000,000	"
Gutta-percha	450,000,000	"
Shellac	9,000,000,000	"
Ebonite	28,000,000,000	"
Paraffine	34,000,000,000	"

The human body offers a resistance of about 300,000 ohms on the closure of the circuit, and of about 3,000 ohms after the current has been flowing for a certain period.

CALCULATING WIRE CONDUCTORS

In practical determinations of the sizes of wire to be used for given circuits, the *mil-foot* at the temperature of zero is taken as the unit. The *mil* is the 1-1,000th of an inch, and is used in measuring the diameter of wires. The cross-sectional area is measured in *circular mils*. A circular mil represents the *square* of the diameter. Thus, if a wire has a diameter of 1 mil, it will also have an area of 1 circular mil. If it has a diameter of 2 mils, it will have an area equivalent to the *square* of 2, which is 4 (2×2). With a diameter of 3 mils, it will have an area of 9 circular mils (3×3).

Therefore, a mil-foot wire is one that has a cross-sectional area of 1 circular mil, and is 1 foot in length. The following table gives the facts necessary in measuring wire for any given circuit:

Metal	Resistance in ohms per mil-foot at zero Centigrade.	Coefficient of temperature rise per degree Centigrade.
Copper	9.59	.00388
Aluminium	15.20	.00390
Iron	58.00	.00453
German Silver	125.91	.00044

The coefficients of temperature rise are used for the purpose of giving the true resistance at any required temperature above

zero Centigrade (32° Fahrenheit). Thus, for any of the above unit-wires the resistance at any given temperature may be found by this formula:

$$R = r \times (C \times T + 1).$$

In this example, R represents the resistance we wish to find; r is the unit resistance of the wire as given in the above table; C is the temperature coefficient of the metal, also given above; T is the given temperature above zero.

Thus, to find the resistance of a unit copper wire at 100° Centigrade, we proceed as follows, always looking at the table:

$R = 9.59 \times (.00388 \times 100 + 1)$. Then,

$R = 9.59 \times (.388 + 1$ or $1.388)$, and performing the multiplication, we have 13.31092 ohms as the resistance at the boiling point.

Since, however, temperature is generally measured in this country by the Fahrenheit thermometer, we shall be obliged, in using this formula, to reduce Fahrenheit degrees to Centigrade. This may be done as follows: *Subtract 32 from the number of Fahrenheit degrees, multiply the difference by 5, and divide by 9.* Thus, if we have 212° Fahrenheit, and wish to find its Centigrade equivalent, we proceed as follows:

$$212 - 32 = 180.$$

Then, $180 \times 5 = 900$,

and, $900 \div 9 = 100$, which represents the degree on the Centigrade scale.

The practical use of all these processes is very great, since the size of wire for any given circuit may be readily determined by their use. Thus, a mil-foot of copper wire at the temperature of 60° Fahrenheit (15.55° Centigrade) will have a resistance of 10.1654 ohms, and 100 feet will have a resistance of 1016.54 ohms. If, therefore, we wish to find the cross-sectional area of a copper wire that will have, for example, a resistance of only 6 ohms per 100 feet, the rule is:

Divide the unit resistance for the required length of wire by the resistance desired in the circuit, in order to find the cross-sectional area of the wire that will give the required resistance.

Thus, for a 100-foot circuit with 6 ohms resistance, we proceed as follows:

$$1016.54 \div 6 = 168.42.$$

The wire that should give a resistance of exactly 6 ohms per hundred feet must have a cross-sectional area of 168.42 circular mils.

WIRE GAUGES

When we know the cross-sectional area of the required wire, we can identify it by referring to the wire gauge tables, as follows. Here, we find that the copper wire sizes nearest are those known as Nos. 27 and 28, the latter having a somewhat larger resistance, the former a considerably smaller one. However, on so short a circuit as 100 feet total, No. 28 would probably answer, unless great exactitude of adjustment was necessary; in which case No. 27 must be used, possibly with an extra resistance piece.

In this country, copper wire is measured by the so-called Brown & Sharpe (B. & S.), or American Wire Gauge, and iron wire, by the Birmingham Wire Gauge (B. W. G.). The following table gives the data for copper wire sizes on the B. & S. gauge, and is approximately correct for average temperatures.

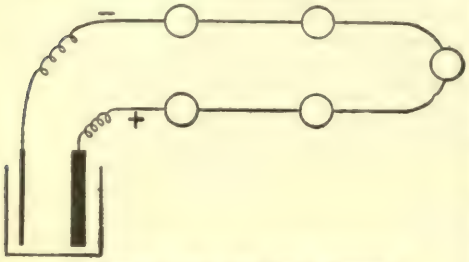
BROWN & SHARP WIRE GAUGE

Gauge Number.	Size. Diameter in Mils.	Size. Square of Diameter or circ'lar Mils.	Resistance. Ohms per 1000 Feet.	Resistance. Feet per Ohm.	Carrying Capacity, 2,000 Amperes p. sq. in. section. Amperes.
0000	460.000	211600.0	.051	19929.7	430
000	409.640	167804 9	.063	15804.9	262
00	364.800	133079 0	.080	12534.2	208
0	324.950	105592.5	.101	9945.3	165
1	289 300	83694.49	.127	7882.8	130
2	257.030	66373.22	.160	6251.4	103
3	229.420	52633.53	.202	4957.3	81
4	204.310	41742.57	.254	3931.6	65
5	181.940	33102.16	.321	3117 8	52
6	162.020	26250.48	.404	2472.4	41
7	144.280	20816.72	.509	1960.6	32
8	128.490	16509.68	.643	1555 0	26
9	114.430	13094.22	.811	1233.3	20
10	101.390	10381 57	1.023	977.8	16
11	90.742	8234.11	1.289	775.5	13
12	80.808	6529.93	1.626	615.02	10.2
13	71.961	5178.39	2.048	488 25	8.1
14	64.084	4106.75	2.585	386.80	6.4
15	57.068	3256.76	3.177	306.74	5.1
16	50.820	2582.67	4.582	243 25	4.0
17	45 257	2048.19	5.183	192.91	3.2
18	40.303	1624.33	6.536	152.99	2.5
19	35.390	1252.45	8 477	117.96	1.96
20	31.961	1021.51	10 394	96.21	1 60
21	28.462	810.09	13.106	76.30	1.28
22	25.347	642.47	16.525	60.51	1.08
23	22 571	509.45	20.842	47.98	.80
24	20.100	404 01	26.284	38.05	.63
25	17.900	320.41	33.135	30.18	.50
26	15.940	254.08	41.789	23.93	.40
27	14.195	201.49	52.687	18.98	.31
28	12.641	159.79	66.445	15.05	.25
29	11.257	126.72	83.752	14.94	.20
30	10.025	100.50	105 641	9.466	.16
31	8.928	79.71	133.191	7.508	.13
32	7.950	63.20	168.011	5.952	.098
33	7.080	50.13	211.820	4.721	.078
34	6.304	39.74	267.165	3.743	.062
35	5.614	31.52	336.81	2.969	.049
36	5.000	25.00	424.65	2.355	.039
37	4.453	19.83	535 33	1.868	.031
38	3.965	15.72	675.22	1.481	.025
39	3.531	12.47	851 789	1.174	.020
40	3.144	9.88	1074.11	.931	.015

VARIETIES OF CIRCUIT

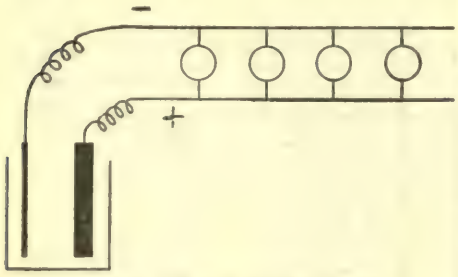
The discussion of resistance brings us logically to the subject of circuits, upon the arrangement of which very much de-

pends in all branches of electrical work. In general, there are two varieties of electrical circuit—the *series* and the *parallel* or *multiple*. As shown by the accompanying diagrams. the arrangement of the *series* cir-



Galvanic Cell and Series Circuit.

cuit consists in coupling the cells, lamps or other apparatus in *tandem*, as it were, so that the current passes through each and all in making the round of the circuit. In the *parallel* or *multiple* circuit, the cells, or other apparatus, are on *bridges* between the



Galvanic Cell and Multiple Circuit.

leads, or wires, the negative poles of all being connected to one lead, the positives to the other.

So much for the arrangement of the two varieties of circuit. Their electrical qualities may be summed in the following rules:

RESISTANCE IN CIRCUITS

(1) In a *series* circuit the total resistance is equal to the resistance of the line wires, *plus* the combined resistances of the cells or other apparatus. The effective electrical pressure of a battery of cells *in series* is equal to the sum of the combined voltages of all the cells, although the resistance is greater, thus reducing the current.

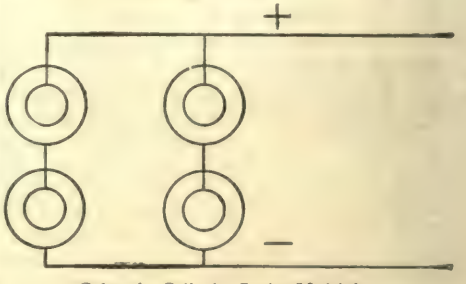
(2) In a *parallel* or *multiple* circuit the total resistance is equal to the resistance of the line wire plus the number of ohms found by dividing the resistance of one cell or other piece of apparatus by the number of such cells or other apparatus. The total E.M.F. of a battery of cells *in multiple* is equivalent to the E.M.F. of one cell forming it.

To illustrate these principles, let us suppose that on a given circuit the *outside resistance*, including wires and all other apparatus, is 8 ohms; that the battery is composed of four chemical cells, each giving a pressure of 1.5 volts, with an internal resistance of 2 ohms apiece. Then, with the cells *in series*, we have a total resistance of 16 ohms, a total voltage of 6, and, by Ohm's Law, a current strength expressed by $6 \div 16 = .375$ ampère.

If in the same circuit of 8 ohms outside resistance the same four cells be connected *in multiple*, we find the resistance thus: $2 \div 4 = .5$; total resistance 8.5 ohms. Total E.M.F., 1.5 volts; current, by Ohm's Law, is $1.5 \div 8.5 = .176$ ampère.

SERIES-MULTIPLE CIRCUITS

There is still a third way of arranging a battery of cells in a circuit. It is called *series-multiple*, and is really a combination of the two other varieties of circuit. Thus, with the four cells already mentioned, we



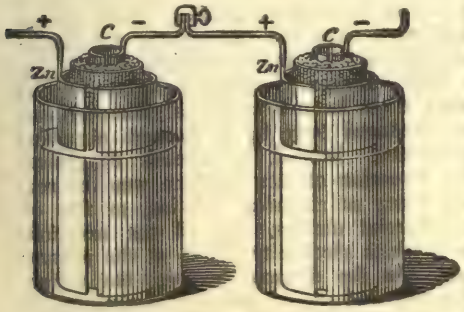
Galvanic Cells in Series-Multiple.

may form a *series-multiple* circuit by connecting two cells *in series*, and arranging the couple on a *bridge* between the leads; arranging the other two cells in precisely similar manner. Then, remembering the resistance and voltage of each cell, as already given, we understand that the resistance of each couple is $2 + 2 = 4$ ohms, and that the voltage of each couple is $1.5 + 1.5 = 3$ volts. But, because each pair of cells is on a bridge—*in multiple*—the total internal resistance of the battery is as the ratio between the resistance of one couple and the number of couples—which is $4 \div 2 = 2$ ohms—or, in this case, equal to the resistance of one cell. In regard to voltage the law of batteries in multiple applies; the total pressure being equal to the

pressure of one couple, or $1.5 + 1.5 = 3$. Hence, the total circuit resistance being $8 + 2 = 10$ ohms, we have, by Ohm's Law, a current of $3 \div 10 = .3$ ampère.

GALVANIC CELLS IN CIRCUIT

In regard to the arrangement of cells in battery suitable for any given circuit, it may be said that there are a number of points to be taken into consideration—the resistance of the circuit, the current strength required and the economy of the battery. With a very high external resistance (*i.e.* resistance in the circuit outside the battery) the greatest current may be obtained with the cells *in series*, as already seen, although an added internal resistance is necessarily involved. This is the least economical arrangement, however, since the greater expenditure of current involves a more rapid deterioration of the cells. Altogether the



Two Galvanic Cells in Series.

most effective arrangement is to construct the battery of a sufficient number of cells to make the total of internal resistances equal to the external resistance of the circuit. However, the end of economy is best attained when the internal resistance of each cell is low; since by this means a correspondingly small portion of the energy is consumed in heating its own resistance. This gives a good current strength with slow deterioration of the elements. That different makes of cell differ in internal resistance, as also in exact voltage-equivalent, we shall learn later.

LAMPS, MOTORS, ETC., IN CIRCUIT

Just as the highest pressure and the greatest current may be obtained with a battery of cells *in series*, also the greatest internal resistance, so also a greater current and a greater pressure are required to operate lamps, motors, and other electrical apparatus connected *in series*. There is also on electrical circuits, particularly when magnetic devices—motors, etc.—are used, several varieties of "false resistance," prominent among which is the so called counter-electromotive force (C.E.M.F.), which, as several authorities remark, "behaves precisely like a pressure exerted in the opposite direction." It follows, therefore, that apparatus *in series* with the battery involves a greater expenditure of electrical energy and a lower efficiency than when *in multiple*. Indeed, it is by no means uncommon in using electrical motors for certain purposes (as *e.g.* on automobiles) to vary the connections to circuit so as to have the field and armature *in series* for low speed, and *in multiple* for higher speed.

This brings us to the fundamental laws regarding the arrangement of circuits:

(1) *With electrical apparatus in series their total resistance is the sum of the individual resistances.*

(2) *With electrical apparatus in multiple their total resistance is as their conductances.*

A moment's reflection will show that this latter rule is merely a restatement of the one already given for batteries. Thus, if we have 100 16-candle-power incandescent lamps *in multiple* on a 110-volt circuit—each lamp having a resistance of 246 ohms, hence consuming current at the rate of .447 ampère, or 3.07 watts per candle-power—the total lamp resistance is equivalent to the voltage divided by the total conductance in ampères. Thus, $110 \div (.447 \times 100) = 2.46$, which is the same as dividing the resistance of one lamp by the number of lamps, or $246 \div 100 = 2.46$. This condition is perfectly in accord with Ohm's Law, which makes the resistance in a circuit equivalent to the voltage divided by the current. Thus, if one lamp requires .447 ampère to light it, 100 lamps will require 44.7 ampères, and if the pressure between the terminals of the circuit is 110 volts, we have $110 \div 44.7 = 2.46$ ohms, as before. The same solutions apply to multiple circuits containing motors or other electrically operated machines.

WIRING A MULTIPLE-CIRCUIT

In order to find the proper size of wire for use on a multiple circuit, the following rule is given:

(1) *Take twice the unit resistance of the given metal at an average temperature.*

(2) *Multiply this figure by the total length of the circuit, and by the number of lamps bridged between the leads.*

(3) *Divide the product by the resistance of one lamp lighted.*

(4) *Determine the percentage of loss, or drop in potential, and subtract it from* 100.

(5) *Divide the product by the same figure expressing percentage of loss.*

(6) *Multiply the two quotients together to find the size of the wire in circular mils.*

If, for example, we have a circuit of 100 feet total length between terminals; 50 lamps to be connected in multiple; each having a resistance of 246 ohms hot; supposing that the percentage of loss is to be 10 per cent, then, as already explained, we find the unit resistence for copper wire at the average temperature of 75° Fahrenheit (23.8° Centigrade), as follows:

$$R = 9.59 \times (.00388 \times 23.8 + 1) = 10.47 +$$

Then, we find the circular mils as follows:

$$CM = \frac{20.94 \times 100 \times 50}{246} \times \frac{\times 100 - 10}{10} = 425.03 \times 9 = 3825.27$$

Reference to the wiring table will show that No. 14 copper wire is the size nearest to the required figure.

THE THREE-WIRE CIRCUIT

Another form of circuit that should be explained is the three-wire circuit frequently used for electric lamps. In this arrangement two dynamos are coupled *in series*, the leads on either side being extended through the entire length of the circuit. Instead, however, of simply arranging the lamps on bridges, or *in multiple*, a third

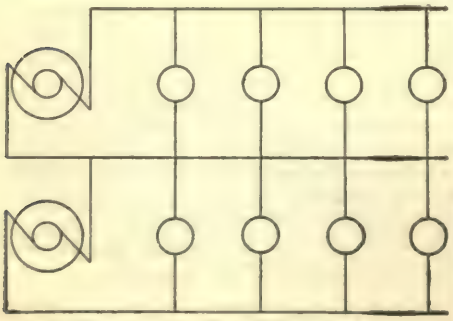


Diagram of a Three-Wire Circuit.

wire is connected to the length of conductor between the terminals of the two dynamos, and the bridges are arranged between it and the other two wires on either side. Such bridges are supposedly arranged directly across the circuit between the two main leads, topping the third wire at points midway in their lengths.

In calculating the electrical conditions with such a circuit arrangement, the resistance is estimated precisely as in the *series-multiple*. Thus, if each complete bridge contains two lamps *in series*, their joint resistance would be, let us say, 246 ohms × 2 = 492 ohms. If there are 100 lamps in the circuit, or 50 2-lamp bridges, the total resistance will be 492 ÷ 50 = 9.84 ohms, or four times the ohmage already found for the same number of lamps *in multiple*. Not estimating the outside resistance of the circuit leads, we may calculate the amount of current required, as follows: Since two dynamos are coupled *in series*, the voltage is 110 × 2 = 220 volts. Therefore, the total current required is 220 ÷ 9.84 = 22.35 ampères, or one-half the figure found for a multiple circuit. Since the total lamp resistance is four times greater on a three-wire circuit, as compared with another of the same dimensions, the resistance of the positive and negative wires must be four times greater, which means that each wire has one-quarter the cross-section required for a multiple circuit.

Such voltages as we have supposed to be used in the lamp circuits just discussed can be produced only by a dynamo electrical generator. Indeed, as already suggested, the invention of this machine was the real beginning of electrical lighting, as also of commercial motors, and all the manifold uses which electricity serves at the present day. As the dynamo involves the understanding and use of electrical quantities not yet explained, it will be described after the theory of primary chemical cells and the properties of circuits have been set forth.

GALVANIC BATTERIES

The primary electrical cell is so called in distinction from the "secondary" cell, accumulator or "storage cell," as being an original source of energy. The simplest form of this apparatus has already been described—a sheet of zinc and a sheet of copper, immersed in a jar filled with a solution of sulphuric acid, and connected together by an outside wire. In such a cell the zinc is attacked by the acid and gradually consumed, but the generation of current does not begin until the circuit of the outside wire is closed, thus making a complete path from one electrode back to the other, over the wire.

Previous to the closing of the circuit no particular obvious changes take place beyond the accumulation of bubbles of hydrogen on the surface of the copper electrode. The hydrogen is liberated as the oxygen in

the solution, or *electrolyte,* combines with the zinc. On the closure of the circuit the operation of consuming the zinc is greatly accelerated, a condition of electrical potential being immediately established and a constant flow of current resulting. The chemical activity is equally marked, consisting, according to the accepted theory in the "polarization" of the molecules composing the solution, so that there is a regular and orderly rotation from one electrode to the other, the oxygen of each being liberated at the zinc plate, to unite with it, and the hydrogen atoms being carried across to the copper surface, there to be deposited in the form of minute bubbles in great numbers. Of course the process can not continue for a very extended period before the accumulation of hydrogen will completely cover the copper, thus greatly increasing the internal resistance. For this reason, a practical cell requires the use of some substance to act as a "depolarizer," which is to say an absorbent of hydrogen. In the most familiar form of zinc-copper cell, the Daniell "crow-foot," so familiar in telegraphy, the zinc electrode is a piece cast into the shape of a hand or claw, with several fingers extended, and is fixed at the upper part of the jar. The copper electrode consists of several sheets placed at the bottom of the cell, with copper sulphate crystals ("blue vitriol") between; this latter material serving to *depolarize* the negative, or copper, electrode as the process of current-generation proceeds. Were it not for this the current would soon cease altogether, and the cell be rendered useless.

INTERNAL RESISTANCE

Having explained the general principles that apply in all forms of chemical primary cell, we may proceed to the discussion of *internal resistance.* In the first place, we may note that the voltage of a single primary cell of given pattern and construction will always be the same, no matter what the size. Although two cells connected *in series* may have a smaller area of active metal electrode surface than another larger cell of the same make, the two cells will give twice as much voltage as the larger—more exactly, twice the voltage *divided by* the combined internal resistances. The only advantage to be gained in making a cell larger is that its internal resistance is thus diminished. If we could make a cell sufficiently large, the internal resistance might be reduced to a negligible figure. The cost would be greater, however, than the advantage; since we would get no more power out of the greater consumption of element.

The electrolyte, or liquid solution, furnishes another necessary source of resistance. Water, although a recognized conductor of current, has a very high resistance, registering, according to best authorities, 2,650,000,000 microhms, or 2,650 ohms, per cubic centimetre at the temperature of greatest density. The addition of an acid, such as sulphuric or hydrochloric, operates to reduce the resistance within limits. Thus, in a 100-part solution, 5 parts sulphuric acid and 95 parts water, the resistance is only 4.86 ohms per cubic centimetre; in a 30 per cent solution, of 70 parts water, the resistance is 1.37 ohms; in a 50 per cent solution, equal parts of water and acid, the resistance is 1.25 ohms. Beyond this point, however, the ohmage again rises rapidly, until with 80 per cent of acid, the resistance is once more about the same as with only 5 parts. It might seem, therefore, that within limits the proportions of acid and water could be regulated to secure a low resistance. But we must not forget that such an arrangement would also hasten the consumption of the zinc element, and thus prove more expensive than a high resistance.

From what has just been said, it is fairly evident that the only really practical methods of keeping the internal resistance of a chemical cell within reasonable figures is to adopt such constructions as shall combine high pressures with good economy. Such results may be obtained either (1) by using as active elements substances of widely differing potential, (2) by providing to properly depolarize the cell.

"NATURAL POTENTIALS"

In a chemical cell the fundamental consideration is the natural potential of the substances used in its construction. By natural potential we may understand the varying property, as between two different substances, of receiving and containing an electrical charge. Substances differ in this particular as in their capacity for conducting current or heat. Indeed, the recognition of this fact was the real beginning of electrical science. When Galvani observed that the legs of a frog hung upon a copper hook, so as to touch a bar of iron, were caused to twitch convulsively, he had really discovered this fact. Subsequent investigations have proved that there is a regular series of substances, so arranged according to potential that, when brought into contact, an electrical discharge occurs. As previously

suggested, the current differs from the momentary discharge, or "shock," only in being continuous.

The first step in the generation of current, therefore, is to immerse two substances of differing potential in a suitable acid solution, then to join them, outside the solution, by a wire that passes through any apparatus to be affected by current, and completes a circuit. Accordingly, we find that the flow of energy, *through the acid solution,* is *from the high-potential* substance *to the low-potential* substance, and, through the outside wire, *from the low-potential* substance to the *high-potential* substance. Such common substances are in regular order:

Through the acid solution	Through the *outside* wire
1—Zinc—11.	
2—Tin—10.	
3—Lead—9.	
4—Iron—8.	
5—Nickel—7.	
6—Antimony—6.	
7—Copper—5.	
8—Silver—4.	
9—Gold—3.	
10—Platinum—2.	
11—Graphite—1.	

Understanding that the flow of energy is in the indicated conditions from the substance having the lower number to that having the higher, we see the entire theory of the Galvanic cell at a glance. It shows that, while the zinc electrode is *positive* within the acid, it is *negative* outside it: hence the zinc is the negative pole of the cell, and the current returns into the solution at the point at which the circuit wire is joined to it.

OPEN-CIRCUIT CELLS

Because, as the above table shows, there is a greater difference in potential between zinc and carbon than between zinc and copper, we may understand why most commercial cells at the present have the zinc and carbon elements. This variety of cell is also of the so-called *open-circuit* type. An open-circuit cell is one that may be used intermittently and left with the circuit open for indefinite periods, without injury. A zinc-copper *closed-circuit* cell, like the Daniell "blue-stone," already described, rapidly deteriorates when the outside circuit is open; the acid simply eating out the zinc, without performing useful work. If, therefore, it is used for any purpose where current is required only occasionally, a resistance equal to or greater than the working load should be switched into the circuit during periods when current is not needed. No cell should ever be left on closed circuit without a good-sized resistance on the outside circuit wire; since this condition, known as short-circuiting, is one of the most fertile occasions of deterioration. *Resistance is a necessary condition to practical electrical activity.*

Apart from the fact that zinc and carbon are the typical elements in open-circuit cells, the essential constructional difference between the two lies in the nature and action of the depolarizer. In the typical closed-circuit cell—the Daniell "blue-stone"—the depolarizer, sulphate of copper, acts constantly to absorb the hydrogen gas on the surface of the copper plates as rapidly as collected. In open-circuit cells, on the contrary, the depolarizer acts only when the circuit is open. Thus, such a cell can generate effective current only for a limited interval; requiring a period of rest, in order to "recuperate," or depolarize.

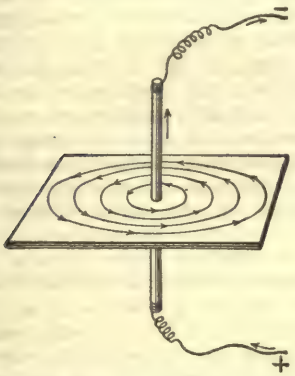
The typical open-circuit cell is the Leclanché, so widely known in telephone and electric bell work. In this cell the zinc is in the form of a pencil or rod; the carbon, in the form of a plate; the exciting liquid, or electrolyte, a solution of sal-ammoniac in water, and the polarizer dioxide of manganese. The manganese is either contained in a porous earthenware cup or is in the form of bricks, or "prisms," mixed with carbon and other substances. There are very many cells, constructed on the same general principles. In one of these the depolarizer is contained in a porous carbon vessel, which also serves as the negative electrode. In several others, the depolarizer is dispensed with—the end being attained by enlarging the surface of the carbon in proportion to that of the zinc. This is a good plan in securing simplicity of construction, also in giving a good-sized voltage with a minimum of internal resistance.

INDUCTION AND MAGNETISM

Hitherto we have discussed the properties of electrical circuits solely with reference to the conduction of current, as it flows between points of differing potential. In its passage through a continuous conducting circuit, a current is able to effect profound chemical changes; to transfer metals, atom by atom, through an electrolytic solution, as in electro-plating and electrotyping; to produce heat where sufficient resistance is interposed; to produce light, where there is a gap between carbon terminals, or where a high-resistance con-

ductor is inclosed in a vacuum, and to give rise to other physical and therapeutic effects.

All this variety of activities tells us nothing, however, about the other influences constantly at work on a current-carrying con-



Whirl of Force Around a Live Wire.

ductor. To take the matter at its root, we find by experiment that when current is flowing along the length of a wire, there are activities manifested constantly at right angles to it. These take the form of concentric circles of force, as may be proved by passing the wire through a hole in a piece of cardboard, and dusting iron filings around it. Furthermore, the insulation that effectually confines the current to the wire conductor, preventing its spread to other conducting substances that happen to come



Arrangement of Force Around a Live Wire.

into contact with it, does not restrict these forces that surround the wire, like so many continuous rings of activity, one within another.

LAWS OF INDUCTION

This fact may be proved by a simple experiment. Let us suppose that we have a circuit of wire whose terminals are connected to the poles of a Galvanic cell, allowing current to flow through it, as soon as it is closed. If we have also another circuit of wire containing no battery, but having its terminals connected to a galvanometer, or current-indicator, we have all the apparatus necessary for demonstrating the phenomenon known as *induction.* This may be done as follows: If in the first circuit we have a finger key that may be operated to close or open it at pleasure, allowing current to flow between the poles of the cell, or cutting it off, we will learn from the galvanometer that immediately upon the closure of the first circuit, a momentary current will flow in the second circuit *in the opposite direction;* also, that, when the first circuit is opened again, another, but

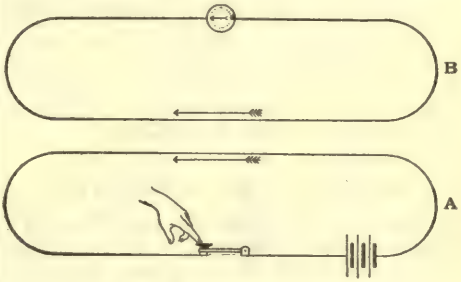


Diagram of Electrical Induction.

weaker, momentary current will flow in the second circuit, but *in the same direction* as in the first. Now, suppose we call the first, or current-carrying, circuit, *A,* and the second circuit, *B,* we will find that the laws governing current induction may be summed up in these statements:

(1) Increasing the strength of the current in *A* increases the strength of the current in *B,* flowing *in the opposite direction* to the current in *A.*

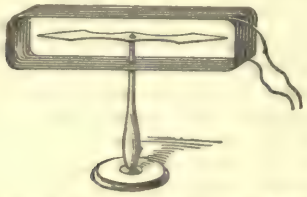
(2) Decreasing the strength of the current in *A* decreases the strength of the current in *B,* also causing it to flow *in the same direction* as the current in *A.*

(3) If we move the current-carrying wire, *A,* nearer to *B,* we induce a strong current *in the opposite direction;* if we move it further from *B,* we induce a weak current *in the same direction.*

(4) If the wire used in circuit *A* is thicker than that used in *B,* the current induced in *B* will show a greater E.M.F.

than that in *A*. Conversely, if the wire used in *A* be thinner than that used in *B*, the induced current will show a lower E.M.F. than that in *A*.

In the same manner, if a circuit including a galvanometer be arranged in the form of a coil, and a magnetized bar be introduced into the "eye" of the coil, the same phenomena will be observed. Also, if a compass needle be placed near a current-carrying wire, it will point with its positive pole in the direction in which the current moves in



Effect of Induction on a Magnetized Needle.

the wire, being drawn from the north. Just as the activity in a magnetized bar can induce a current in a closed circuit of wire, so, when a wire is wound about an iron or steel bar, the current passing through it will cause it to become a magnet.

MAGNETS AND MAGNETISM

Magnetism is nearly the most important factor in present-day electrical activity—forming the basis of the dynamo generator and motor, as well as of the telegraph and telephone industries. The number of devices, based upon the simple principle of inclosing a bar of iron in a coil, or helix, of insulated wire, is surprisingly large.

At the start, however, we must understand definitely that the essential difference in simple voltaic induction, between two circuits of wire, as just explained, and magnetic induction by which the current in a helix of wire imparts magnetic properties to a bar of iron, lies in the fact that the former is only momentary, at the closure or opening of the "live" circuit, while the second exerts its influence so long as current flows in the helix. If the bar is of soft iron the magnetism ceases when the current in the helix ceases; if it is of hardened steel a permanent magnet is produced —the magnetic properties lasting after the current and helix have been withdrawn.

Every magnet has, to use general terms, a positive and a negative, or a north and a south, pole. The difference may be readily discovered by experiment. Thus, if the north pole of one magnet be brought near to the south pole of another, there will be mutual attraction and a tendency to come together; but, if two north poles or two south poles be brought together, there will be repulsion, or a tendency to fly apart.

This fact may be readily explained by the theory that the magnetic force induced in a bar of iron by the current flowing in a helix follows the direction of the inducing current. At the positive, or north, pole, the movement is in a direction contrary to the hands of a clock—if we look at the end of the bar—and at the negative, or south, pole in the same direction as the hands of a clock. Thus, as may be understood on reflection, if the opposite poles of two magnets be brought together, the direction of rotation is continuous, and energy from one flows into the other, causing the phenomenon of "attraction"; while, with the bringing together of the like poles of two magnets the movements in the two are contrary, hence allowing no transfer of energy, and causing the phenomenon of "repulsion."

POLARITY OF MAGNETS

The position of the poles of a magnet may thus be determined by the direction of winding the coil or helix. If this is wound *in the direction in which a clock's hands move,* or from left to right, the *north* pole is at the end opposite to that at which the current enters. If it is wound *in the direction opposite to that in which a clock's hands move,* the *north* pole is at the same end at which the current enters. This fact is important in telegraphy and some other branches, enabling the construction of differentially-wound magnets having two windings in opposite directions.

POWER OF MAGNETS

The strength, or pulling-power, of a magnet depends broadly upon the number of ampère-turns in the helix, or the number of turns given to a wire that can carry one ampère of current. Magnets are wound with a number of superposed layers, generally to a depth equal to the diameter of the core, or iron bar in the centre of the coil. The finer the wire the greater the number of turns, consequently the greater the magnetic effect, in spite of the fact that a fine wire has a greater resistance than a thick wire. The explanation is simple: Winding with a large number of turns of fine wire allows more magnetic circles of force to

act upon the core; while winding with the same number of turns of thick wire would quickly place the core out of reach of the circles of force of the outer turns, which would thus be rendered useless in affecting it. Within limits, then, the strength of a magnet properly wound is determined by the strength of the current in the helix, giving a greater or less intensity of magnetic activity at right angles to the wire. This fact holds within limits because too great a current would tend to heat the wires and burn out the insulation. Thus, very powerful magnets must be made with large cores wound with proportionately heavy wire.

MAGNETIC LINES OF FORCE

Just as the fundamental fact connected with an electrical circuit is a flow of energy, or current, from the point of high potential to that of low potential, so in a magnet there are lines of force constantly acting between the poles, and, with a straight bar magnet forming series of arcs between the two. If we take a permanent bar magnet and place it near a quantity of iron filings we will find that these will be attracted to both poles, and will adhere there with considerable force. But toward the centre of the bar we will see very few. This indicates that there is some system in the magnetic power of attraction, and that it is not the same at all points.

If now we place over the bar magnet a plate of glass or a sheet of stiff paper, and on it dust a quantity of iron filings, we will find the filings starting out from either pole, and at points midway between, describing arcs or parts of circles, over the bar, and meeting in the middle of the "field."

The lines thus described by the filings are supposed to represent the lines of force, or the direction of the current, as it leaves the north pole and re-enters at the south.

If we place one pole of a magnet under a card holding iron filings, these filings arrange themselves as rays, or straight lines starting from a common centre.

MAGNETIC UNITS

In treating and measuring magnets and magnetic strength, we are introduced to a new series of quantities and units, as follows:

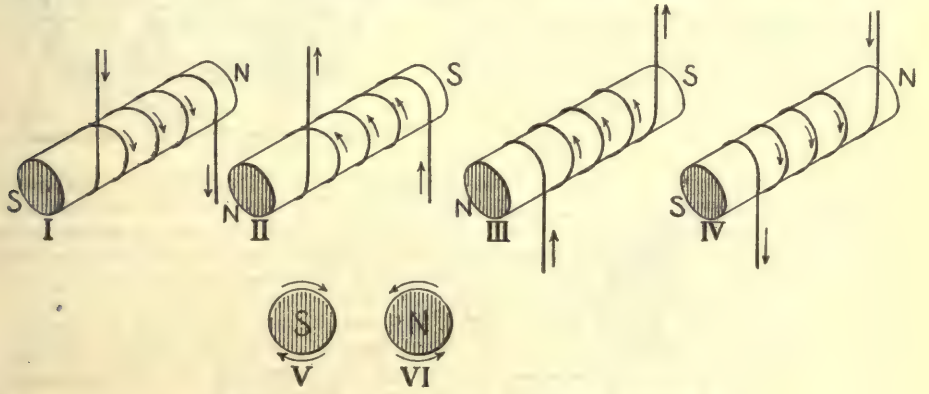
(1) Magneto-motive force (M.M.F.), whose unit is the *gilbert.*

(2) Magnetic current, or flux, whose unit is the *maxwell.*

(3) Magnetic resistance, or reluctance, whose unit is the *oersted.*

(4) Magnetic density, or intensity, whose unit is the *gauss.*

The *gilbert* is the amount of magnetizing force developed by a current of .7958 ampère flowing through one ampère-turn of wire wound on the iron core. Consequently, a current of one ampère will give 1.257 gilberts M.M.F.



Polarity of Bar Magnets and Directions of Windings.

CALCULATING FOR MAGNETS

The number of ampère-turns in a solenoid is the product of the number of complete convolutions by the number of ampères carried on the wire. Thus, with 100 turns of wire adjusted to carry 3 ampères at a given voltage, we would have 300 ampère-turns. If the voltage is doubled, we have twice the ampèrage, hence 600 ampère-turns. If it is half as great, we have only half the ampèrage, hence only 150 ampère-turns.

In order, therefore, to find the number of *gilberts* developed in a given magnet, we take one-tenth the product of 4 multiplied

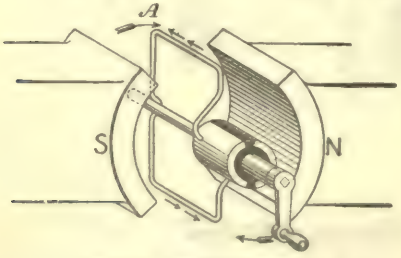
by 3.14159 and multiply it by the number of ampère-turns. The figure, 3.14159, is the ratio between the circumference and diameter of a circle—thus the circumference of every circle is 3.14159 times its diameter. Since wire wound about an iron core is circular in section, it is necessary to use this figure in determining the relation between the force moving on the circumference—this is the electric current—and the force acting at right angles to it. Then, taking a helix of 300 ampère-turns, as above, we have:

$(4 \times 3.14159 \div 10) \times 300 = 377.1$ *gilberts.*

The calculation of *reluctance* and *flux* depends largely upon experiment, determining the *permeability, susceptibility,* and other properties of the iron used in the core. In general, however, *reluctance,* like electrical resistance, increases with the length and decreases with the area—of the core. The *flux,* like electric current in Ohm's Law, varies directly with the M.M.F. and inversely with the *reluctance.*

DYNAMOS AND MOTORS

The facts already explained will enable us to get a clear idea of the operation of electrical dynamos and motors. These machines consist essentially of double or multiple-pole

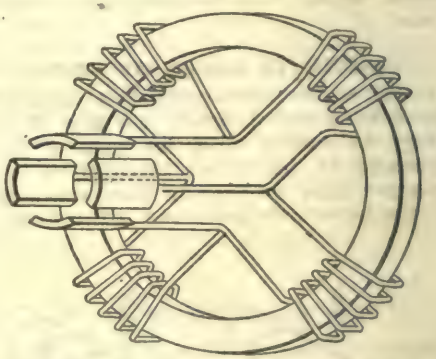


Simplest Possible Dynamo.

electro-magnets, between the poles of which is placed a rotating wire-wound armature. An accompanying figure, showing the simplest possible form of dynamo, gives all the essential points of the machine. Here we have the north pole, N, and the south pole, S, of an electro-magnet. Between the pole pieces is a rotating spindle turned by a handle, and carrying a single turn of wire, A, the ends of which are attached to the two-part commutator shown near the handle.

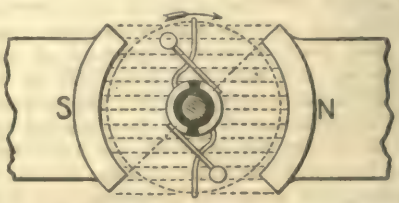
In this figure the loop of wire would be called the "armature," and the greatest difference between this simple machine and the powerful dynamos used to produce currents to move street cars and supply electric lights is in the construction of the armature. In the latter, instead of a simple loop of wire, there are a great number of such loops or of coils, wound on a "drum," or "ring," and running at right angles to the magnetic lines of force. The rule is that, electromotive force (E.M.F.) generated by any dynamo, is in proportion to the number of turns of wire about the "core," or frame-piece, of the rotating armature; and, within certain limits, to the speed with which the armature is revolved.

In the next figure is shown a diagram of one method of winding a ring armature and



Ring Armature and Four-Part Commutator.

attaching the terminals of the several coils to the segments of a four-part commutator. The next figure shows such an armature in position between the pole pieces, the lines of magnetic force being indicated by the dotted lines across the end of the armature. The connections of the coil to the commutator segments are also shown, and the *brushes,* for taking off the current resting on the periphery of the commutator. On rotating the armature on its spindle the



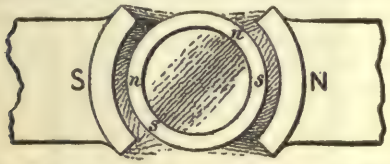
Armature in position between the field-poles of a dynamo, showing lines of force (dotted), direction of rotation, and the arrangement of brushes on a two-part commutator.

condition follows that is shown in the next figure. The lines of force are greatly deflected as indicated by the broken lines in this cut, and by the turning of the armature a very intense excitement of the "field" is

created. From this excitement a current results, whose strength for work is in proportion to terms of the rule quoted above.

OPERATION OF A DYNAMO

The effect produced by the revolving of the armature of a dynamo is that the armature itself is transformed into an electromagnet, having two north poles and two south poles, points for the exit and entrance of the current, respectively. These poles alternately exert an attracting and repelling force on the magnetic field, and hence continually distort the magnetic lines of force. The result is a constant shifting of the neutral points, and a continual series of alternate attractions and repulsions at the active points. These rapid changes, demanding a constant readjustment of the magnetic lines, transform the magnetic movements among the molecules into electrical energy, which emerges in the form of a current at the terminals of the armature winding attached to the segments of



Distortion of the lines of force in a two-pole dynamo, showing induced polarity of the armature.

the commutator, being conveyed to the outside circuit by flat pieces, called brushes, which rest against the commutator, as shown in a former figure.

Of course the cycle of operations already described involve that an alternating current is produced, one that moves first in one direction then in the other. However, by using a commutator of 2, 4, or any larger number of parts, and by placing the brushes at a certain point, on what is called the "diameter of commutation," the effect of a continuous direct current is obtained.

If a dynamo is to generate an alternating current, the terminals of the armature winding are attached each to a separate collector ring, instead of to the segments of a commutator. A brush then rests on each ring, and the current flows in one direction or the other over the outside circuit, according to the position of the rotating armature, which causes a continual fluctuation from maximum to minimum in the current generated in its winding. If three collector rings are used, and proper connections are made to the armature winding, a three-phase current may be produced, which, of course, requires a three-wire circuit. Alternating and polyphase currents are useful in power transmission, being capable of traveling to greater distances than a direct current, without serious impairment of power.

DIRECT CURRENT MOTORS

An electric motor is in all essential particulars identical with a dynamo, except for the fact that a current, led to the windings of both field magnets and armature, produces a rotation of the armature, on account of the conditions already described above.

A dynamo may be run as a motor with no other changes than shifting the brushes to a backward lead—which is to say, placing them at opposite ends of a diameter toward, instead of away from, the direction of rotation—at an angle from the theoretical diameter of commutation, which is at 90 degrees to the magnetic lines of force. In a dynamo, as just explained, the rotation of the armature, cutting across the lines of force between the field magnets, tends constantly to increase the electromotive force of the current generated in the armature coils, with the result of strengthening the field, or, as the term is, increasing the number of magnetic lines. In this process a counter-electromotive force is constantly generated as the speed of rotation increases. In a motor, on the other hand, the current is supplied to both the armature and the field magnets, and, giving them both polarity, sets up an attractive force between them, thus producing rotation of the armature. Consequently, in a motor the magnetic drag, which tends to retard the rotation of a dynamo armature, is the real driving force, exerting a rotative pull upon the current carrying wires of the armature coil and upon any protruding portions of its core. Another operative difference lies in the fact that, while the C.E.M.F. generated by rotation of a dynamo moves in the same direction as the current, that generated in a motor moves in the opposite direction. Consequently, in a motor the C.E.M.F. increases (1) with increased strength of field and (2) with increased speed of armature rotation. With a series-wound motor, therefore, an increased rotation involves a smaller absorption of energy from the electrical source, on account of the increased generation of C.E.M.F., and, when working under a heavy load, necessitating a reduction in speed, less C.E.M.F. is generated and more energy is absorbed.

CALCULATING AN ELECTRIC MOTOR

In calculating the power of a motor, we must remember that the force at work produces rotation of the armature, and is, therefore, called the *torque,* or twisting force. Such a force is able to raise a given weight suspended to a cord wound around a pulley on the shaft. On this account it is measured in terms of foot-pounds, as indicating an amount of energy able to move so many pounds through so many feet. Furthermore, the time occupied in this work is important, since a greater power can raise a given weight more rapidly than a smaller power. Thus, if we have a motor that can exert a working torque of 100 foot-pounds at a rotative speed of 50 revolutions per second, we can find its power in foot-pounds by multiplying the product of these two quantities by twice the ratio between the circumference and diameter of a circle (3.141592). Thus:

$100 \times 50 \times 6.283184 = 31415.92$ foot-pounds.

This divided by 550 gives 57.12 horsepower.

More complicated formulæ are necessarily used in exact calculations, but this is fundamental.

EFFICIENCY OF MOTORS

The efficient power of an electric motor depends upon the torque, or twisting power, exerted upon the spindle of the armature, causing it to rotate. Furthermore, the amount of torque, or the efficient twisting force expressed in foot-pounds, depends upon the amount of flux in the armature core, and that, upon the current strength circulating in its coils; consequently, also, upon the number of wires wound upon its circumference. On the other hand, although a high-powered motor armature rotates less rapidly than one of lower power, the efficient output of a given motor is, within proper limits, in direct ratio to the number of revolutions per minute of its armature, consequently, within its limits, to the impressed E.M.F. Thus the speed, and consequently also the power, of a stationary motor may be varied by throwing in resistance through the full capacity of the rheostat, thus decreasing the kilowatt input. Also, a motor that, from some inherent peculiarity of its construction or materials, runs at low speed, at a given pressure, for a given power, if wound for a higher speed, will give a higher power equivalent, while another motor, running at an unusually high speed for its power efficiency, is working at its full capacity.

POWER AND SPEED OF MOTORS

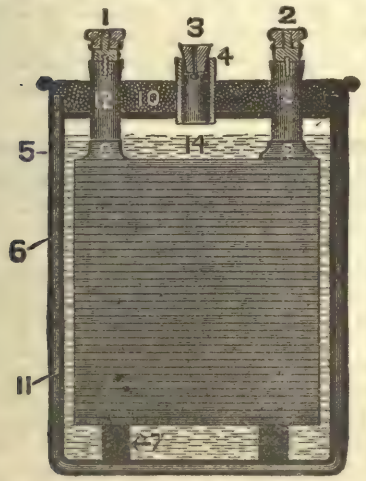
The power efficiency of a well-built electric motor varies directly, within definite limits, as its weight. Thus, as given by several authorities, a ½-horsepower motor should weigh about 100 pounds, or 200 pounds per horsepower, while a 5-horsepower motor should weigh about 600 pounds, or 120 pounds per horsepower, and a 15-horsepower about 1,500 pounds, or 100 pounds per horsepower, which seems to be the general ratio for all powers above that. It is thus evident that, while the higher powers involve greater weights, and the higher efficiencies involve greater speeds, the weight per horsepower and the speed of rotation both decrease with the higher rating of the motor. Similarly, the characteristic normal speeds, estimated as revolutions per minute of the armature spindle, decrease with the higher ratings. A ½-horsepower motor should run normally at about 1,300 revolutions per minute, or at a ratio of 2,600 revolutions per horsepower; the 5-horsepower motor, at 900 revolutions, or 180 per horsepower, and the 15-horsepower motor, at 750 revolutions, or 50 per horsepower. With higher powered motors the normal speed decreases on a constantly smaller ratio. Thus, a 250-horsepower motor runs normally at about 425 revolutions, or at a ratio of 1.7 per horsepower.

As may readily be inferred from the data already given, the efficiency of an electric motor increases directly with its power. Thus, in the broad average, motors of low power consume about one kilowatt of input current per horsepower of output, although the rule rapidly fails with increasing powers, until the horsepower output is in excess of the kilowatt input—which is to say, the internal resistance of the motor is decreased until the efficiency reaches as high as ninety per cent or slightly above. Thus if a well-designed 6-horsepower motor requires an input current of about six kilowatts, or 6,000 watts, which is approximately equivalent to 8 horsepower, its operation represents only 4,476 watts, or 74.6 per cent efficiency. As a rule the efficiency, represented by the input and the output of smaller motors, is much lower. Thus, a small fan motor yields, on an average, less than forty per cent efficiency; a 2-horsepower motor represents about sixty per cent; and a 100-horsepower motor about

ninety per cent, or approximately an output of 74.6 kilowatts to an input of 82.9.

ELECTRIC STORAGE BATTERIES

An electric storage battery, or accumulator, is an instrument capable of being so affected by an electric current passed through it that certain chemical transformations are electrolytically produced, which will occasion the giving-off of a current, so soon as the original source is disconnected and a circuit is closed through any other suitable devices. For these reasons it is more correctly to be described as a "secondary battery," deriving its power to produce current



Section through a small storage cell, showing one plate in position. Numbered parts are: positive binding post (1), attached to plate shown; negative binding post (2), attached to plate at rear of that shown; rubber stopper of cell (3); vent tube (4); outer metal case (5); lead lining of case (6); hard rubber insulator (7); positive element or plate (8); negative element or plate at its rear (9); sealing of cell (10); hard rubber jar (11); terminal of all positive plates (12); terminal of all negative plates (13); the fluid or electrolyte (14).

from impressed conditions, rather than from the differing specific potentials of two natural substances—as, for example, copper and zinc—as in the typical galvanic or chemical primary cell. When, however, the required conditions are thoroughly impressed by an outside agent, the internal reactions of a secondary cell are very similar to, although nearly the reverse of, those observed in a primary cell, resulting in both cases in the production of a current.

In the secondary battery the electrolytic process, by which the active surfaces of two plates are continuously consumed in producing a current on the outside circuit, depends upon the use of different chemical substances on the surface of two plates of lead—this is the substance most commonly used, although some others have been found partially suitable—and electro-chemically restoring the normal conditions, when the exhaustion has sufficiently progressed. Were it practicable to thus restore, or "recharge," an ordinary copper-zinc primary cell, we would have precisely the conditions theoretically occurring in the secondary battery, except for the fact that the latter seems to be a complete reversal of the former, showing the action on the outside wire that the primary shows in the electrolyte. Thus, in the operation of the secondary cell, we find that the positive plate is the one attacked by the oxygen, while the hydrogen unites with the negative.

In both varieties of cell, however, the strength and pressure of the current depend principally upon the ability of the components of the decomposing electrolyte to unite with the substance of the electrodes. This is shown in the action of the earliest type of "storage battery"—if we may so term this device—in which two sheets of platinum or silver were partially immersed in an aqueous solution of sulphuric acid. By connecting the two plates to the poles of an active galvanic cell, a distinct electrolysis was set up, which resulted in an accumulation of oxygen bubbles on the surface of the anode and of hydrogen bubbles on the surface of the cathode. When the surfaces have thus been covered, the primary cell may be disconnected, and on closing a circuit between the two immersed plates a weak current will be observed to flow from the plate, used as the anode in this experiment, to that used as the cathode, such current continuing until the recomposition of the water is complete. Because, however, oxygen can not attack, or unite with, silver or platinum, under such conditions, the current is weak and of short duration.

PRACTICAL SECONDARY BATTERIES

In order to obtain a practical secondary battery, the first requirement is that we use two plates of some metal that may be readily attacked by the separated components of the electrically decomposed solution. Hitherto lead has been found to be the most advantageous substance for a commercial cell.

In passing a current through a cell composed of two lead plates, the resulting electrolysis is evidenced by the collection of bubbles at the cathode and by the chemical modification of the anode, whose surface, under the action of the oxygen thus liberated, becomes transformed into lead peroxide. The operation of "charging" such a cell may be continued until it begins "gasing," at which point the limit has been reached, and it is ready to give off a brief and weak current, during the recomposition of the water, as in the case of the silver or platinum cell described above.

The problem of increasing the current strength and pressure of a storage battery is, therefore, in brief, how the surfaces of the plates exposed to the electrolyte may be increased, in order to permit the formation of a greater quantity of lead peroxide, and the absorption of a larger proportion of hydrogen gas. This condition obviously holds good, since, if the surplus hydrogen is allowed to escape into the atmosphere, the recomposition of water, on which the current depends, can not take place. There are, accordingly, two distinct types of battery, distinguished primarily by the method adopted in increasing the active surfaces. They are usually designated by the names of their original inventors, as the Planté and the Faure types.

PLANTE AND FAURE CELLS

In the original Planté cell smooth lead plates were used, as in the experimental device described above. The charging surface of the two was then increased by a process of "forming," which was conducted in the following manner: A current was sent through the cell by connecting one plate, A, to the positive terminal of a dynamo, and the other, B, to the negative pole. As soon as the charging was complete, the cell was discharged, or nearly so, and it was again connected up to the dynamo in reversed direction, B serving as the anode and A as the cathode. By repeated chargings, dischargings and reversals, the surfaces of both plates were so thoroughly attacked by the liberated oxygen as to assume a porous or spongy appearance. Thus a larger quantity of both oxygen and hydrogen could reach the metal before the charging limit was attained. Cells formed in this manner gave an efficiency rating of 7.5 ampère-hours per pound of lead, but presented the difficulty, shared by virtually all commercial secondary batteries, that an increase of output-efficiency involves a correspondingly brief duration of usefulness: the plates rapidly became thoroughly rotten and had to be replaced.

The Faure, or pasted, battery was originally devised to overcome the difficulty of increased efficiency at the expense of durability. Its fundamental theory is to construct the positive and negative plates on different lines, chemically. Thus, he applied the required chemical substances directly to the surfaces of the plates—red lead to the positive plate, and litharge, or lead monoxide, to the negative. These active substances are attached to the plates by depositing them in suitable scratches, indentations, or perforations. Thus, the many varieties of this type of cell are distinguished primarily by the manner of making the grids and applying the active material. The composition of the paste also differs among them.

DISCHARGING A STORAGE CELL

In discharging a storage battery, several chemical changes are brought about. Thus the oxygen in the electrolyte begins to attack the spongy surface of the negative plate, releasing hydrogen, by the action of which the lead peroxide of the positive plate is reduced to monoxide and the oxides on both to sulphates. In charging again these conditions are reversed, the sulphate on the negative plate being changed to metallic lead, and that on the other to peroxide. In either case the series of chemical reactions and changes continue until the entire exposed surface has been attacked. If charging is continued beyond this point the fact is evidenced by the giving-off of gas in the shape of bubbles on the surface of the electrolyte, as in the primitive platinum battery previously described.

Several general rules are adopted in charging. In the first place, the voltage of the charging generator should be about ten per cent higher than that of the battery itself in discharging. Thus, for a battery of one hundred volts a charging current of one hundred and ten volts is generally used. In averaging the rates specified by the various manufacturers, the ampèrage of a normal charging current should be about one-eighth that of the battery itself in discharging. Thus, a 400 ampère-hour battery is normally charged with a current of fifty ampères for 8 hours, although any cell may be charged in a shorter period by following instructions furnished by the manufacturers.

CAPACITY OF STORAGE CELLS

The output, or discharge, capacity of a fully charged secondary cell is estimated in ampère-hours, generally at the 8-hour rate of discharge. Such a cell, however, may be discharged at any rate with a slight increase in ampèrage as the rate is raised. Thus a certain cell, rated at 800 ampère-hours, gives 100 ampères of current at the 8-hour discharge, 140 at the 5-hour discharge, 200 at the 3-hour, and 400 at the 1-hour.

The output of a storage cell, as estimated in ampère-hours, gives a fair indication of its efficiency, since the standard cell is constructed to register between 2 and 2.5 volts at full charge. Various rules have been given for calculating the current output, for example, giving between 7 and 8 ampère-hours per pound of lead, or about 6 ampère-hours per square foot of positive plate surface. Neither rule is conclusive, however—giving too high a rating for some makes and too low a rating for others—since the manner of constructing the cell and the nature of the active material employed are important factors in modifying the efficient strength in current. Such figures would also indicate merely the ampèrage at a given rate of discharge, as the above figures indicate. Theoretically, the most authoritative rule gives 40.24 ampère-hours per pound of lead sulphate, making the assumption that the entire active material of both plates is transformed into this substance in discharging, which is never accomplished in practice. The earlier Planté cells yielded a current of 7½ ampères per pound of metallic lead, which is a fair average for its genus to the present time.

ALTERNATING CURRENTS

Most of what has been said in the present article refers to direct current electricity. There is another variety, however, known as the alternating current, which has a wide significance in modern electrical engineering. We have already learned that in direct-current apparatus the circuit has a positive and a negative pole or terminal, the current emerging from the source at the former and re-entering it at the latter. This is necessarily the case with the energy generated in a galvanic or chemical cell. With an alternating current the movement is first from one terminal and then from the other, each being in turn the positive and the negative. The movement of such a current may be graphically represented by a straight line, from a point of which an irregular arc is drawn to another point further on. This represents the rise and gradual fall of potential in the current moving in one direction. From the latter point another similar irregular arc is drawn *under the line*, indicating the gradual rise and fall of potential of the current moving in the opposite direction. In these two arcs, drawn between three points on the line, we have what is technically known as a complete "cycle," or the interval between the points at which the current again moves in the direction taken at the start. Thus, calling the three points *A*, *B*, and *C*, we find that an arc begun at *C* would be above the line again, etc.

There are several varieties of alternating current, differing, as the saying is, in phase. Thus the simple alternating current just mentioned is the monophase, or single phase. There is also the two-phase or quarter-phase current and the three-phase. The two-phase current may be compared to two single-phase currents on the same circuit, the second beginning at approximately the highest point of the first. It requires four wires to conduct it. The three-phase current may be compared to three single-phase currents, following one another at, say, one-third of a phase apart. It requires three wires to conduct it. All alternating currents move in certain frequencies, which is to say perform so many complete cycles per second. The standard three-phase current used in power transmission is 125 cycles. The standard single-phase current for electric lighting is 60 cycles.

WIRELESS TELEGRAPHY

THE term "wireless telegraphy" is commonly applied to a system of signaling through space by means of electric waves. In 1864 Clerk Maxwell published his electro-magnetic theory of light, and predicted the existence of electric waves similar to light waves. In 1888 they were discovered experimentally by Heinrich Hertz at the University of Berlin.

When a spark jumps across a gap between two conducting surfaces, such as two metal balls, the electric charge of the two bodies oscillates back and forth and sends off into space ether waves, which travel with the speed of light. They differ from light waves only in being much longer, as they are from half an inch to many feet in length, while light waves are between 15 to 29 millionths of an inch long. These waves can be reflected by metals; refracted by prisms and lenses of wax; polarized by wood; and diffracted, just like light waves. They pass through wood, earth, stone, and such materials, but metals are opaque to them. When emitted from the summit of the aerial wire, or antenna, of a space-telegraphy apparatus, these waves move out in ever enlarging concentric circles, resembling nothing more closely than the effect on the surface of a pond produced by throwing a stone into the water. According to the most exact estimates, they vibrate at the rate of 230,000,000 per second, traveling outward from the emitting source, in all directions, at the rate of 186,400 miles per second.

When such electric waves strike a circuit of wire with the ends nearly touching, or two pieces of metal at the extremities of a gap in a circuit, a spark passes across the gap. A still better apparatus for detecting the presence of electric waves is the coherer, invented in 1897 by Guglielmo Marconi, which has made wireless telegraphy practicable. This is a small glass tube exhausted of air and filled with fine filings of nickel and silver. In the ends are silver plugs which come within about one millimetre of meeting.

The Marconi apparatus, as now used, consists of a wire reaching as high as possible into the air, usually suspended from a mast. This is connected with an induction coil having a spark gap, and when the spark passes the electric waves are sent out in all directions. The receiving apparatus is the coherer already described, in circuit with a battery and an electric bell, sounder, or telephone. When the electric waves from the oscillator reach the coherer it becomes a conductor, the circuit is completed, and the signal is given.

There are other methods of electric signaling without wires which may become practically developed. W. H. Preece in England has sent messages several miles by two methods—conduction and induction. In the first the current is sent through the earth itself, and in the second a body charged with electricity induces the opposite charge in a similar body at a distance.

GENERAL PRINCIPLES OF THE MARCONI SYSTEM

WORKING along the lines of a theory propounded by Prof. Joseph Henry, Hermann von Helmholtz, and several other electrical authorities, Dr. Heinrich Hertz demonstrated by a series of elaborate experiments that the discharge, or "shock," from a Leyden jar, or other form of condenser, is not a merely direct passage of energy from a point of high potential to one of lower potential, but consists rather in a "series of rapidly surging waves, oscillating until equilibrium is established." The same holds true for the effects given off from a momentary current in an electric circuit. In conducting his experiments he made use of the form of oscillator now almost universally employed in wireless telegraphy apparatus—a Ruhmkorff coil giving a very high-tension current in its secondary winding, the two poles of the secondary circuit ending in two highly polished brass balls. These two brass balls, the distance between which is adjustable, are held on the ends of rods holding sliding spheres, D, D. By altering the positions of these spheres, the oscillator may be tuned to the resonator. This resonator is a coil or open circuit, whose two terminals also end in brass knobs. With such a resonator, adjusted to the wave lengths given off by any particular oscillator, and placed within the discovered area of effect, the discharge will be followed by a spark between its knobs. The fact of wave motion was demonstrated by the fact that in some positions, near to the coil, no effect was noticeable, while at others, further from it, a spark was obtained—thus establishing the fact of loops and nodes. That these waves, like those of light, could be reflected, Hertz demonstrated by the use of polished concave metal mirrors, arranging his oscillator and resonator each in front of one of the mirrors. By placing the coil in front of a similar mirror with a prism of pitch at a determined distance, the fact of refraction of the waves was also demonstrated with the resonator, although in this experiment, as in the others, the dimensions of the resonator—which is to say, the total length of wire forming the coil of its open circuit—must be in proportion with the wave lengths of the reflected vibrations, a principle still recognized in

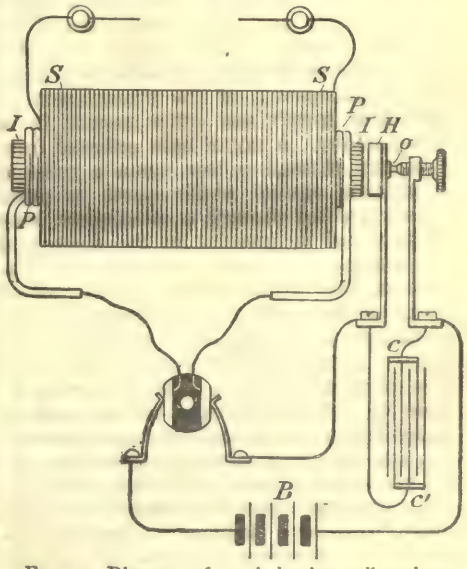


FIG. 1.—Diagram of an induction coil and attachments of the type employed on wireless telegraphy circuits. The parts are the battery (*B*); the iron core (*I*) composed of a bundle of wires; the primary winding (*PP*) connected to the terminals of the battery through the switch; the secondary winding (*SS*) wound over the primary; the iron hammer of the magnetic vibrater (*H*); the back stop of the vibrater (*O*) that adjusts the amplitude of the vibrations, breaking the primary circuit so many times per second, according to adjustment at *O*, thus enabling an induced alternating current in the secondary winding. The terminals of the secondary are led out to either side of a gap, across which a spark may arch, in length, according to the tension in the secondary. A condenser (*C C'*) is bridged between the leads of the primary circuit, being charged and discharged at each make and break, thus demagnetizing the core and allowing greater frequency of alternation in the secondary.

the various devices for obtaining syntonic, or tuned, effects between two wireless telegraph stations.

Although the Hertz open-circuit resonator, when attuned to the proper undulatory amplitude, can reveal the presence of a Hertzian wave of its own vibratory frequency—exhibiting the phenomenon found in a high-tension secondary coil, a spark between the terminals—it is not used as a receiving instrument in any system of wireless telegraphy. In receiving the impulses transmitted across a distance without wires, another principle—in which again light and Hertzian waves resemble one another—is utilized. This is the discovered ability of both varieties of wave force, under given conditions, to modify the resistance of an electrical circuit. In the case of light this fact is demonstrated in the interesting process of radiophony, or the transmission of articulate speech and other sounds by a luminous ray. A ray of light reflected from a mirror, through a lens, upon a polished diaphragm, against which speech or other sounds are led through a mouthpiece, may be so varied in intensity, by the superposed frequencies of sounds striking the diaphragm, that, being focused upon a cell of selenium included in a live electric circuit, it can vary the resistance of the circuit, so as to permit a reproduction of the sounds in a telephonic receiver. The involved principle of variant resistance is the same as is applied in the carbon telephone transmitter, and enables it to convey to line the exact vibrations of vocal and other sounds.

In practical space-telegraphy an instrument known as a "coherer" is employed, to operate on precisely the same principle on being affected by Hertzian impulses—namely, to modify the resistance of an electrical circuit. The coherer, as used by Marconi, is a modification of the apparatus called the "Branly tube." It consists of a vacuous glass tube at either end of which enter the conducting wires of the circuit. Each of these wires is joined to a silver plug, and the space between them is loosely filled with nickel filings. In normal condition the resistance to the electrical current offered by this device may be equal to several megohms, but, under the influence of magnetic force, or when exposed to the action of a Hertzian wave, the resistance is instantly lowered, being estimated, perhaps, only in units or tens of ohms. The conductivity thus produced continues after the cessation of the affecting impulse, or until the tube is tapped lightly, which act "decoheres" it. For this reason the decoherer is an essential part of all Hertzian telegraphic apparatus.

In all systems of space-telegraphy to the present time the tall aerial wire, or antenna, is an essential feature. This wire is carried into the air on a pole or mast, the height of this, relatively at least to other parts of the apparatus, having a very definite effect on the distance of the transmission, also on the selective efficiency, as will be presently explained. Of the three prominent systems, the Marconi, the Slaby-Arco, and the Braun, the first two earth the extremity of the secondary circuit extension opposite to

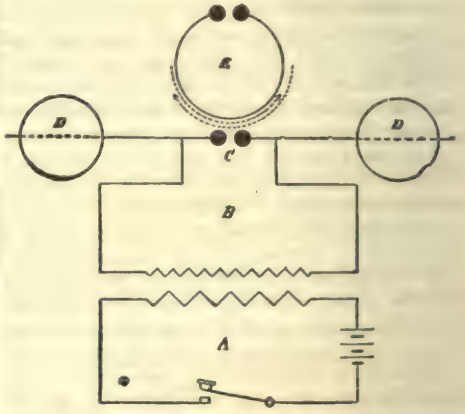


FIG. 2.—Diagram of the Hertz oscillator and resonator as used in wireless telegraphy. *A* is the primary circuit including battery and hand key; *B*, the secondary circuit, including the spark gap *C* and the adjusting balls, *D D*. *E* is the resonator. Dotted arrows show the directions of the alternating induced currents.

the aerial wire. The Braun system avoids this feature, with several resulting advantages, according to published claims.

The general features of a Marconi nonselective space-telegraphing apparatus are shown in Fig. 3. Here, as may be readily seen, the transmitting apparatus is essentially a Hertz oscillator with one extremity, A, of the oscillator circuit extended vertically into the air; the other, B, grounded. The key, C, for closing the primary circuit of the coil, is used to tap out the Morse signals, which are transmitted through space in the form of successive undulations. At the receiving station the coherer, C, is included in series between the aerial, A, and the ground, B. It is also included in the circuit of the battery, D, with the inductive resistances, or reactance coils, E E, connected to its terminals for the purpose of

preventing the Hertzian impulses from leaking into the battery circuit. At each moment of coherence the immense resistance of the coherer is broken down and current from battery, D, moving unobstructed, energizes the relay, F, closing the circuit of battery, G. Current from this battery energizes the sounder, H, delivering the Morse messages, also the magnet, K, operating the decoherer, and causing its clapper, L, to lightly tap the coherer tube. Bridged upon this circuit are the non-inductive resistances, M and N, which act to prevent sparking at the sounder and decoherer contacts. Another such coil, P, is similarly run parallel to the relay, F.

The apparatus arrangements thus shown agree in all essential particulars with those used by Marconi to the present time, and, with such variations as can increase the message-carrying power of the vibrations, are adequate to all requirements in short-distance space-telegraphy. Indeed, the most important differences between the Marconi and other systems are found, not in the methods of transmitting and receiving, but in the peculiar devices adopted to attain the end of selective, or syntonic, signaling through space. That this problem is by no means a simple one is evidenced

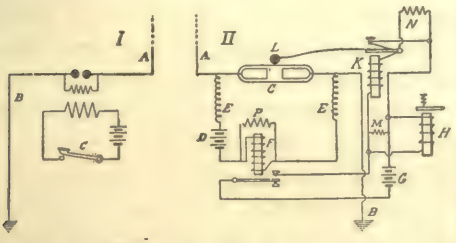


FIG. 3.—Diagram of the transmitting (*I*) and receiving (*II*) stations of a Marconi wireless telegraph circuit. In *I*, *A* is the aërial wire; *B*, the grounded wire; *C*, the Morse telegraph key in primary circuit. In *II*, *A* and *B* same as before; *C*, the coherer; *D*, battery in circuit with coherer; *E E*, inductive resistances; *F*, relay closing circuit of battery, *G*; *H*, the sounder; *K*, magnet of decoherer. *L*; *M*, *N*, *P*, non-inductive resistances to prevent sparking.

by the number of widely divergent methods adopted by experimenters in their efforts to perfect its solution.

To the casual student the most immediate expedient would seem to be found in making the aerial wires of different lengths, using a given length for transmitting signals to a receiving station with the same length, thus securing, so far as musical analogy holds good, a common amplitude and frequency between the two. That this consideration has a very definite bearing on the matter can not be denied, but, taken by itself, it is not sufficient to all requirements. Mr. Marconi explains this fact in the following words: "A dead-beat radiator—*i.e.*, one that does not give a train or succession of electrical oscillations—is not suitable for tuned or syntonic space-telegraphy. . . . A transmitter consisting of a vertical wire

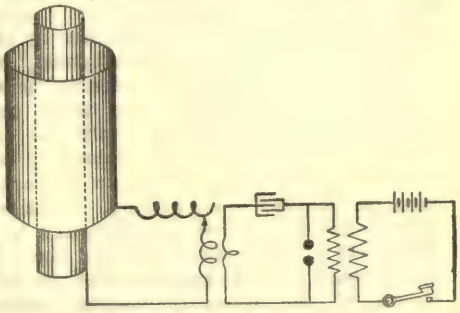


FIG. 4.—Transmitter station of Marconi wireless telegrah, equipped with combined cylinder and transformer apparatus for syntonic selective signaling.

discharging through a spark-gap is not a persistent oscillator. Its electrical capacity is comparatively so small and its capability of radiating waves so great that the oscillations which take place in it must be considerably damped. In this case, receivers or resonators of a considerably different period or pitch will respond and be affected by it."

With the obvious aim of increasing the oscillatory power of the transmitter, Marconi devised the double cylinder arrangement, shown in Fig. 4. Two concentric metal cylinders were used, the inner one connected to earth, the outer to the antenna, with the oscillator circuit bridged between. In explaining the theory of this apparatus, Mr. Marconi says: "One necessary condition of this system is that the inductance of the two conductors should be unequal, it being preferable that the large inductance should be joined to the non-earthed conductor. I assume that in order to radiate the necessary amount of energy, it is essential that there should be difference in phase of the oscillations in the two conductors, as otherwise their mutual effect would be to neutralize that of each other." With the first experimental use of such an apparatus, using cylinders seven meters in height, he states that the "signals were not interfered with or read by other wireless telegraph installations worked by my assistants

or by the Admiralty in the immediate vicinity," between St. Catherine's, Isle of Wight, and Poole, a distance of three miles.

Such a system is thus selective, in the sense that it secures exclusiveness. In order to secure complete selectiveness between a large number of stations, so equipped, it would be necessary, of course, to vary the apparatus in regard to its capacity, oscillatory frequency, and amplitude of vibrations emitted and received.

Another selective device consists in the use of a double-wound transformer, or "Tesla coil"; the primary winding being included in circuit with the spark coil secondary and a condenser, with the oscillator on a bridge, and the secondary being connected on the one side to the aerial wire, on the other to the ground. In the receiving station a similar transformer was interposed between the aerial and the coherer, which latter was included in the circuit of the secondary winding, other arrangements being virtually the same as in non-selective receiving apparatus. On the point of adjusting this apparatus, Mr. Marconi says: "The period of oscillation of the vertical conductor can be increased by introducing turns of wire, or decreased by diminishing their number, or by introducing a condenser in series." It is essential, however, that the two electrical circuits of the transmitter should be tuned to the same period, or octave, of electrical oscillations, which is to say, that there should be a predetermined fixed relation between the number of turns in the transformer primary and secondary. The condenser bridged on the coherer circuit has the effect of making the tuning more marked, "by increasing the capacity of the secondary resonating circuit of the transformer." Briefly described, the peculiar resonance of any given selective station is proportionate to the windings, with which, as in the Braun system, the oscillatory intensity may be stepped up or stepped down.

AUTOMOBILES

THE automobile, or self-propelled road carriage, is one of the most conspicuous facts of present-day life. We see it in all forms, from the light motor-driven bicycle to the five-ton truck or large passenger omnibus. Although automobiles have geen built and used in America only during the last six or eight years, it is a remarkable fact that they really antedate the railroad. As long ago as 1769, a certain Captain Cugnot of the French army built a steam carriage for use with artillery. It was an awkward, topheavy affair, having a single front wheel hung on a fork, so as to be turned by a steering wheel, and at the same time driven by a primitive sort of engine whose steam was drawn from the huge kettle-like boiler made to swing with the front wheel. Although a great curiosity in his time, as also at the present day (it is still preserved in a museum in Paris), it could only make about three miles an hour on the very best roads, and would fall headlong down every bank if the driver were not both strong and careful. During the early years of the nineteenth century a number of engineers, particularly in England, actually built and operated heavy steam carriages of large power. Some of these could make a speed as high as twenty miles an hour, carrying a dozen or twenty passengers, and weighed several tons. Indeed, the industry increased so rapidly that steam road carriages were for some years formidable rivals of the then newly invented railroad locomotive. What the result would have been if Parliament had not made the law in 1845 reserving the highways for horse carriages we can not say. We know, however, that this was the reason that nothing was done in the way of perfecting these vehicles for nearly fifty years.

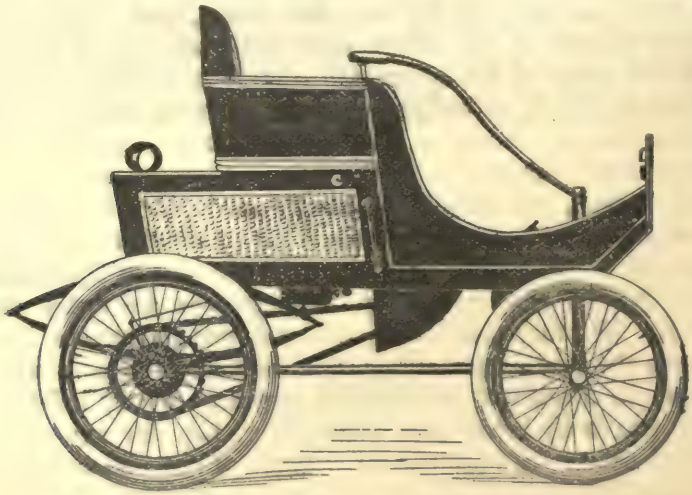
To be sure an occasional enterprising engineer would build a steam carriage that was both heavy and slow-going, but the day of modern automobiles did not arrive until the last decade of the nineteenth century. In 1885 Gottlieb Daimler of Cannstatt, Germany, invented the high-speed, internal-combustion engine, operated by the gas of gasoline or other spirit. He fitted this motor to a tricycle, and later to a four-seated carriage, thus making the first step in the direction of the modern gasoline vehicle which is so familiar a sight in all parts of the world at the present time. The next or more important stages in the evolution of the automobile were due to the labors of the French engineers, Panhard-Levassor, the Peugeots, Mors, and others who operated under Daimler's rights in

France, and eventually brought the motor vehicle to its present high perfection. Meantime, in 1889, another French engineer, Leon Serpollet, had invented his famous flash boiler, or steam generator, consisting of several coils of flattened steel tubing, which, heated over a fire, would instantly vaporize water injected through them. Since this apparatus was both safe and efficient, it was very well suited for a light and compact steam carriage, and for this purpose he used it. Since the practical perfection of the electrical storage battery the electric automobile has also appeared.

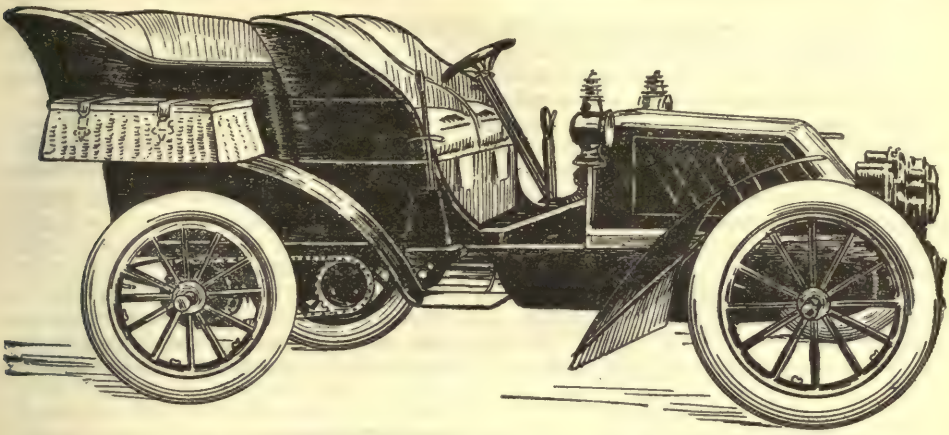
MOTOR VEHICLES BRIEFLY DISCUSSED

THE THREE TYPES OF VEHICLE

THERE are at the present time three types of motor vehicle—steam, gasoline, and electrical. Steam carriages are necessarily complicated and difficult to manage by persons not skilled in the theory of the steam-engine. While there is little or no danger of exploding, there is constant trouble from the boilers burning out, due to allowing the water to sink to too low a level. This is an accident due to carelessness and insufficient knowledge of the machine. The safety of automobile boilers may be easily explained. The shell is generally made of steel, while the flues passing through the crown plates at either end are of copper. Since at high temperatures steel expands more rapidly than copper, the result of overheating with the small amount of water in the boiler will be simply that the excess of pressure will cause one or more of the flues to collapse, thus putting out the fire, and allowing all steam to escape through the bottom of the boiler. This is a startling occurrence, but by no means a dangerous one, and saves the life of the passenger at the expense of a set of new flues. Because of the constant danger of break-downs, burning-out, and defective valves in a steam carriage with an unskilled driver, the gasoline machine is always growing in popularity. It is easier to manage, has no boiler, requires no furnace, may be started by turning a crank, and stopped by throwing out a clutch connecting the motor to the driving-wheels. As for the electric carriage, its sphere of usefulness is confined to city traffic or to very short tours out of town, since its radius of travel is limited to the capacity of its storage batteries of one charge of current. Thus few



A steam runabout—a familiar type of light American automobile.



A typical gasoline touring car. This is modeled on French lines, and represents a type of carriage that is followed by very many American manufacturers. The motor is beneath the sloping bonnet over the forward axle, and drives to a transverse countershaft, which is connected by chains and sprockets to the two rear wheels.

electrical vehicles can travel more than 25, or at most, 40 miles before the batteries must be charged again.

THE DIFFERENTIAL GEAR

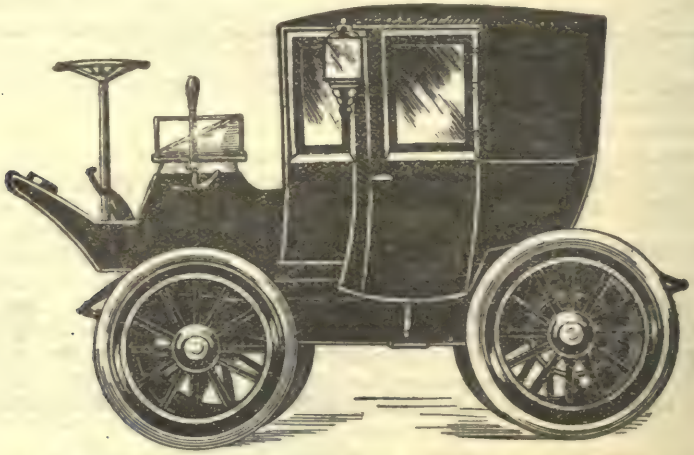
It may be said that the motor carriage resembles a horse carriage only in the fact that it runs on four wheels and has the same kind of a body. For its successful operation it requires several apparatus that have never been used on any other type of vehicle. In the first place, in order to transmit power to the two rear wheels, it is necessary that a device known as the differential gear be placed on the rear axle. Briefly described, a differential gear is a machine that can enable the two driving-wheels to turn at different speeds. This is necessary when the carriage has to turn a corner, for if both the wheels were always moving at the same speed, the vehicle could turn only on a very large curve, such as is necessary to use in railroad tracks.

This, of course, would make it impossible to turn a street corner, or to get out of the way of another vehicle in the same road. How the differential gear works may be easily understood from a brief description. The rear axle in most automobiles turns around with the power transmitted from the engine. The two wheels are keyed fast to it, instead of being hung loose on a boss, as in horse carriages. In order to arrange the differential gear the rear axle is divided in the centre, and to each end is keyed a bevel gear or toothed wheel. Between these two bevel gears is hung the sprocket, and on several of its spokes are bevel pinions, meshing with the two bevel gears just described. When the carriage is driving straight ahead the bevel pinions are held fast between the teeth of the gears and do not turn on their axes. They thus act to carry both halves of the divided axle shafts. As soon, however, as the steering wheels make a movement to turn the carriage one of the driving wheels becomes a pivot or centre, around which the other moves. It thus offers a resistance against the forward movement imparted to the sprocket, and the bevel pinions, let on to its spokes, immediately begin to turn on their axes, traveling over the face of one gear, while still imparting movement to the other. Thus the movements of the wheel are perfectly compensated; the one continuing to move at full speed while the other is revolving very slowly or is entirely stationary.

STEERING APPLIANCES

In steering the motor carriage it is necessary to have pivoted stud axles, as they are called, instead of the swinging front axle, as in horse carriages, with wheels arranged to cut under the body. Briefly described, these axles consist of short bosses, which are hinged at either extremity of a rigid axle shaft, so as to swing the connected wheels backward or forward as the driver may desire. The steering mechanism is very simple. Each one of the stud axles carries an arm at right angles to its length, and these

two arms are connected across the width of the carriage by a link bar. The link steering lever may be connected by suitable arrangements so as to give the two wheels on their pivot inclination to the left or right. From the fact that the steering is usually accomplished with the front wheels and the driving by the rear wheels, it is easy to see that when the former are inclined in any direction the movement given by the latter will turn the carriage round in the arc indicated by the inclination of the front wheels. In order, however, to prevent the wheels from skidding or slipping sidewise, when attempting to turn, it is necessary to arrange the front wheels so that they will describe concentric arcs in turning. Were this not done the turning would be extremely uncertain, even when no accident occurred.



An electric cab of familiar type. The batteries are contained in the box under the body, and the motors are hung on the "dead" rear axle, driving to the wheels direct.

RUBBER TIRES

In order to secure good traction on ordinary streets and roadways, it is necessary to use rubber tires, either solid or pneumatic. This saves a good deal of power that would otherwise be wasted, since the effect of the rubber surface is to take a firm grip of the surface of the road, thus allowing all the power to be used in turning the wheels, rather than overcoming useless resistance. Pneumatic tires have the further advantage of a resilient support, saving the passengers from many of the shocks of travel on an uneven road that would otherwise be imparted to the body and running gear, greatly to the disturbance of the machinery and the annoyance of the passengers.

AUTOMOBILE UNDERFRAMES

It is also necessary to have a flexible underframe, in order that nothing may be strained or broken in passing over uneven road surfaces or along the side of slopes. Regarding the springs that are necessary it may be stated briefly that they must be longer and more yielding than those used with horse carriages. The reason is that they must be able to bear all the jolts and shocks of travel at high speed, and at the same time absorb the vibrations of the motor.

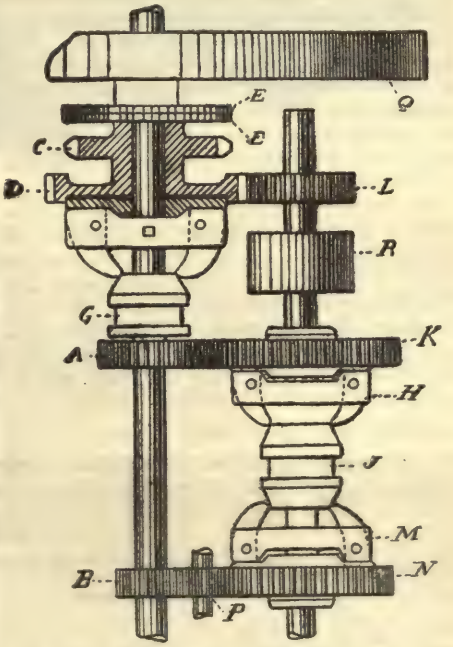
SPEED CHANGING

In regulating the speed of an automobile there are several things to be considered, since the driver should always keep before his mind the old maxim that an increase of speed generally means a decrease of power. Consequently he will find that in attempting to travel over a heavy road or up a steep hill, it is easier to move on the low speed than on a high one, provided that any form of mechanical speed changer is used. With steam-engines the speed and power are varied at the same time by changing the point of cut-off by the link, or by regulating the inlet of steam with the throttle. With gasoline engines the speed

may be varied over a wide range by throttling, which operates by regulating the amount of fuel charge admitted to the combustion space, or by changing the ratio of gas and air passing from the carburetter. With electric vehicles the situation is somewhat different, since the speed and power of an electric motor, within certain limits, are in direct ratio. Thus, although very few electric vehicles are driven through more than a single reduction, it is necessary to change the speed and power by changing the pressure of the batteries. This is done by varying the couple of the battery units from multiple connection to series. All gasoline vehicles are provided with a device known as the speed-changing gear which affords a ready means for varying the speed without throttling the motor, also for reversing the travel of the carriage. Such a device consists either of sliding spur gears or of some arrangement of sun and planet wheels, whose relative movements are regulated by band and drum clutches. Such a change-speed gear, which is used on a well-known make of American motor carriage, is shown in the accompanying illustration. The use of such gears as the only means of varying the speed of a motor carriage is by no means economical, since the power output of the engine is always the same, whether the carriage be traveling at the lowest or highest speed. The best practice with a three-speed gear, which is the most usual form, is to start the carriage by throwing on the clutch at low gear, and when it has fairly begun shift to intermediate gear and vary the speed by throttling. It is necessary to use the low gear only when ascending hills or passing through heavy places in the road. At such times the power is the principal consideration, and the speed only secondary.

SPEED CHANGING IN ELECTRIC CARS

In the typical electric automobile the armature shaft is direct-connected with a spur pinion, meshing with an internal or external gear attached to the road wheel. This is the general practice where two motors—one for each drive wheel—are used, in which case the act of making long turns retards the rotation of one motor's armature, causing the motor to "act as a dynamo," since its C.E.M.F. overbalances the E.M.F. of the battery. Other makes of carriage have a single motor arranged to drive a countershaft containing a differential gear, or to drive direct on the differential drum of a centre-divided "live" axle. In practically all carriages reversal is accomplished by a rotary switch, which changes the direction of the current flowing to the armatures, the reversal being invariably accomplished after throwing on the lowest speed combination. Braking is usually accomplished by shoe or hand brakes after the power has been dis-



A typical American speed-changing gear. The motor fly-wheel, *Q*, is on a shaft carrying keyed gears, *A* and *B*, sprocket, *C*, and gear, *D*, turn loose on the shaft. By throwing on the friction clutch, *G*, the friction disks, *E* and *F*, are pressed together, and the sprocket drives from the main shaft, giving the high speed forward. By throwing in clutch, *H*, gear, *A*, drives *K*, and *L* drives *D*, giving the low speed forward. By throwing in clutch, *M*, gear, *B*, drives *N* through idler, *P*, and *L* drives *D* and sprocket, *C*, in the reverse direction. Thus one backward and two forward speeds are obtained.

connected, although in emergencies the switch is often reversed and the high speed thrown in.

Speed changes are accomplished by varying the connections of the batteries between the series and parallel arrangements; the range of speeds and pressures thus made available varying only with the number of battery units used. It is a common practice, particularly with a few units, to use a variable rheostat to still further increase the range; while, when two motors are used,

it is customary to vary the connections of the field windings, sometimes also of the armatures, between series and parallel arrangements.

Thus, with a two-unit battery supplying energy to two motors, three possible speed combinations are available. The first, or lowest, speed has the two battery units connected in parallel and the fields of the two motors in series-parallel, thus reducing the E.M.F. of the battery and the intake capacity of the motors each one-half. The second speed has the two battery units in series and the fields in series-multiple, thus giving three-quarter efficiency. The third, or highest, speed, has the battery units in series and the fields in multiple, thus giving full power.

Of course, the effect of connecting the battery units in series, or "in quantity" as the English have it, is to give a cumulative effect to the E.M.F., thus increasing the pressure to a figure equivalent to the sum of the individual unit voltages; by connecting the four units into series-multiple this total figure for E.M.F. is halved, and by connecting them in parallel it is quartered, or made equivalent merely to the voltage of each unit. The opposite efficiency effects are obtained by connecting the motors. In series the C.E.M.F. of the armatures is cumulatively exerted on the line, thus halving the efficiency of the battery pressure; in multiple, it is reduced to unity, thus allowing full effect to the battery pressure.

The storage cells used in automobiles contain either five or seven plates, and vary in weight between thirty-five and sixty pounds each. Their output capacity ranges between 200 and 300 ampère-hours. Taking such a four-unit battery, consisting of 44 cells, of 300 ampère-hour capacity each, and of 49.5 pounds weight each, the series arrangement would give a pressure of 88 volts, the series-parallel of 44 volts, and the parallel of 22 volts. With a well-constructed 6-horsepower motor, the highest pressure arrangement should give 1,250 revolutions per minute, the second, 600 revolutions, and the third, 300 revolutions. Such a battery, however, would weigh 2,178 pounds.

GAMES OF CARDS

THE most familiar of parlor games are played with suit cards, which have been in common use for centuries. The exact origin of cards is uncertain, but it is certain that their use dates from a very remote period. Many of the games are also very ancient, at least in their general principles. Cards have been used not only for social games, but also for gambling and as a means of divination, or fortune-telling. There is no use of condemning them, however, on this account, since gambling and fortune-telling can be done with any kind of apparatus. It is better to learn to regard cards as a means of innocent amusement than to associate them wholly with the evil ends for which some people use them.

Card-playing was first put upon a scientific basis by the writings of Edmund Hoyle, whose treatise on whist is one of the classics of the English language. Many new games have arisen since he wrote (in 1743), but whist still holds first place in the estimation of most card-players.

RULES AND TERMS IN PLAYING WHIST

LONG WHIST is played by four persons, with a *complete* pack of fifty-two cards. The four players divide themselves into two parties, each player sitting opposite his partner. This division is usually accomplished by what is called *cutting the cards*, the two highest and the two lowest being partners; or the partnership may be settled in any other way that may be decided on. The holder of the lowest card is the dealer. But previous to their being dealt, the cards are "made"—that is, shuffled—by the elder hand, and "cut" by the younger hand. The undermost card in the pack, after it has been shuffled and cut, is the "trump."

THE PLAY.—The whole pack is now dealt out card by card, the dealer beginning with the player on his left, the elder hand. The last card—the trump—is then turned face upward on the table, where it remains till the first trick is won. The deal completed, each player takes up his allotted thirteen, and arranges them in his hand according to the several suits—the Hearts, Clubs, Spades, and Diamonds by themselves in their regular order. The elder hand now leads or plays a card. His left-hand adversary follows, then his partner, and last of all his right-hand adversary. Each player must "follow suit," if he can, and the highest card of the suit led wins the "trick"; or if any player can not follow suit, he either passes the suit: that is, plays some card of another suit, or trumps: that is, plays a card of the same suit or denomi-

nation as the turned-up card. Thus, we will suppose the first player leads a nine of spades, the second follows with a ten, the third, who perhaps holds two high cards, plays a queen, and the last a two or a three. The trick would then belong to the third player, who won it with his queen. The winner of the trick then leads off a card, and the others follow as before, and so on till the thirteen tricks are played. A second deal then takes place as before, and so the game proceeds till one or the other side has obtained ten tricks, which is *game*.

The order and value of the cards in whist is as follows: Ace is highest in play and lowest in cutting. Then follow king, queen, knave, ten, nine, eight, seven, six, five, four, three, two, the lowest.

Scoring.—But there are other ways of scoring points besides tricks. The four court cards of the trump suit are called *honors;* and the holders of four score *four* toward the game; the holders of three score *two;* but if each player or each set of partners hold *two*, then honors are said to be *divided*, and no points are added to the game on either side. Thus, A and C (partners) have between them the ace, knave, and queen. At the end of the deal or round, they say and score *two by honors;* or, B and D hold ace and king only, while A and B have queen and knave in their hands; then the *honors are divided.*

All tricks above six score to the game. All honors above two score in the way explained—*two* points for *three* honors, *four* points for *four* honors.

There being thirteen tricks which must be made in each round or deal, it follows that seven points may be gained, which, with the four honors, would finish the game in a single deal. This stroke of good fortune is, however, seldom attained. It is much more likely that four or five deals are made before the game is won. As we have explained, *ten points* is game in long whist.

In short whist, which is the ordinary game cut in half, *five points* win. But if either side get up to *nine* points, then the holding of honors is of no advantage. In the language of the whist-table, *at nine points honors do not count.* But at eight points, the player who holds two honors in his hand has what is called the privilege of *the call.* That is, he may ask his partner if he has an honor—"Can you one?" or "Have you an honor?" If the partner asked does hold the requisite court card, the honors may be shown, the points scored, and the game ended. But the inquiry must not be made by the player holding the two honors *till it is his turn to play,* nor must the holder of a single honor inquire of his partner if he has two.

Nor does the holding of four honors entitle the partners to show them at any stage of the game except at eight points. To put the matter epigrammatically, *at six or seven points, tricks count before honors; at eight points, honors count before tricks.*

At nine points, honors do not count. It must be understood, however, that, in order to count honors *at eight points, they must be shown before the first trick is turned, or they can not be claimed* till the round is completed. Thus it might happen that the partners at eight points, holding the honors between them, and neglecting to show them, would be beaten, even though the other side wanted three or four tricks for the game.

A single game is won by the side which first obtains the ten points by a majority of one, two, three, or four points.

A double game is made when one side obtains *ten* points before the other has scored *five.*

A lurch or *triplet* is won by obtaining ten points to nothing on the other side.

A rubber is two games won out of three.

The points of a rubber are reckoned thuswise: For the single game, *one* point; for the double, *two* points; and for the rub, *two* points. Thus it is possible to obtain *six* points in one rubber—namely, two doubles and the rub.

A lurch or triplet is in some companies reckoned for *three* points. Generally, however, a lurch is only counted as a double game where triplets are counted; it is possible, therefore, for the winners to obtain *eight* points.

A slam is when the whole thirteen tricks are won in a single hand.

The game is usually marked on the table by coins or counters, or by the holes in a cribbage-board. Many pretty little contrivances have been invented as whist-markers.

TECHNICAL TERMS USED IN WHIST

Ace.—Highest in play, lowest in cutting.

Blue Peter.—A signal for trumps, allowable in modern play. This term is used when a high card is *unnecessarily played* in place of one of lower denomination, as a ten for a seven, a five for a deuce, etc.

BUMPER.—Two games won in succession before adversaries have won one; that is, a rubber of full points—five at long whist, eight at short.

CUT.—Lifting the cards, when the uppermost portion (not fewer than three) is placed below the rest. The pack is then ready for the dealer.

CUTTING-IN.—Deciding the deal by each player taking up not fewer than three cards, and the two highest and two lowest become partners. In case of ties, the cards must be cut again.

CUTTING-OUT.—In case of other person or persons wishing to play, the cut is adopted as before, when the highest (or lowest, as may be agreed on) stands out of the game, and does not play.

CALL, THE.—The privilege of the player at eight points asking his partner if he holds an honor—"Have you one?" The partners having eight points are said to *have the call*. When each side stands at eight, the first player has the privilege. No player can call till it is his turn to play.

DEAL.—The proper distribution of the cards, from left to right, face downward.

DEAL, MIS-.—A misdeal is made by giving a card too many or too few to either player; in which case the deal passes to the next hand.

DEAL, FRESH.—A fresh or new deal, rendered necessary by any violation of the laws, or by any accident to the cards or players.

DOUBLE.—Ten points scored at long whist before adversaries have obtained five; or in short whist, five before three.

ELDER-HAND.—The player to the left of the dealer.

FACED CARD.—A card improperly shown in process of dealing. It is in the power of adversaries in such cases to demand a new deal.

FINESSING.—A term used when a player endeavors to conceal his strength, as when, having the best and third best (as ace and queen), he plays the latter, and risks his adversary holding the second best (the king). If he succeed in winning with his queen, he gains a clear trick, because, if his adversary throws away on the queen, the ace is certain of making a trick. The term finessing may be literally explained by saying a player chances an inferior card to win a trick with while he holds the king card in his hand.

FORCING.—This term is employed when the player obliges his adversary or partner to play his trump or pass the trick. As, for instance, when the player holds the last two cards in a suit, and plays one of them.

HAND.—The thirteen cards dealt to each player.

HONORS.—Ace, king, queen, and knave of trumps, reckoned in the order here given.

JACK.—The knave of any suit.

KING CARD.—The highest unplayed card in any suit; the leading or winning card.

LEAD, THE.—The first player's card, or the card next played by the winner of the last trick.

LONG TRUMPS.—The last trump card in hand, one or more, when the rest are all played. It is important to retain a trump in an otherwise weak hand.

LOOSE CARDS.—A card of no value, which may be thrown away on any trick won by your partner or adversary.

LONGS.—Long whist, as opposed to short.

LURCH.—The players who make the double point are said to have lurched their adversaries.

LOVE.—No points to score. Nothing.

MARKING THE GAME.—Making the score apparent, with coins, etc., as before explained.

NO GAME.—A game at which the players make no score.

OPPOSITION.—Side against side.

POINTS.—The score obtained by tricks and honors. The wagering or winning periods of the game.

QUARTE.—Four cards in sequence.

QUARTE MAJOR.—A sequence of ace, king, queen, and knave.

QUINT.—Five successive cards in a suit; a sequence of five, as king, queen, knave, ten, and nine.

RENOUNCE.—Possessing no card of the suit led, and playing another which is not a trump.

REVOKE.—Playing a card different from the suit led, though the player can follow suit. The penalty for the error, whether made purposely or by accident, is the forfeiture of three tricks.

RUBBER.—The best two of three games.

RUFFING—Another term for trumping a suit other than trumps.

SEQUENCE.—Cards following in their natural order, as ace, king, queen, two, three, four, etc. There may, therefore, be a sequence of four, five, six, and so on.

SINGLE.—Scoring, at long whist, ten tricks before your adversaries have scored five.

SEE-SAW.—When each partner trumps a suit. For instance, A holds no diamonds,

and B no hearts. When A plays hearts, B trumps and returns a diamond, which A trumps and returns a heart, and so on.

SCORE.—The points gained in a game or rubber.

SLAM.—Winning every trick in a round.

SHORTS.—Short whist as opposed to long.

TENACE.—Holding the best and third best of any suit led when last player. Holding tenace, as king and ten of clubs. When your adversary leads that suit, you win two tricks perforce. [*Tenace minor* means the second and fourth best of any suit.]

TREBLE.—Scoring five (at short whist) before your adversaries have marked one.

TERCE.—A sequence of three cards in any suit.

TERCE MAJOR.—Ace, king, and queen of any suit held in one hand.

TRICKS.—The four cards played, including the lead.

TRUMP.—The last card in the deal; the turn-up.

TRUMPS.—Cards of the same suit as the turn-up.

TIES.—Cards of like denomination, as two kings, queens, etc. Cards of the same number of pips.

TRUMPING SUIT.—Playing a trump to any other suit led.

UNDERPLAY.—Playing to mislead your adversaries; as by leading a small card though you hold the king card of the suit.

YOUNGER HAND.—The player to the right of the dealer.

SHORT RULES

FOR FIRST HAND OR LEAD

(1.) Lead from your strong suit, and be cautious how you change suits; and keep a commanding card to bring it in again.

(2.) Lead through the strong suit and up to the weak, but not in trumps, unless very strong in them.

(3.) Lead the highest of a sequence; but if you have a quart or quint to a king, lead the lowest.

(4.) Lead through an honor, particularly if the game be much against you.

(5.) Lead your best trump, if the adversaries be eight, and you have no honor; but not if you have four trumps, unless you have a sequence.

(6.) Lead a trump if you have four or five, or a strong hand; but not if weak.

(7.) Having ace, king, and two or three small cards, lead ace and king, if weak in trumps, but a small one if strong in them.

(8.) If you have the last trump, with some winning cards, and one losing card only, lead the losing card.

(9.) Return your partner's lead, not the adversaries'; and if you have only three originally, play the best; but you need not return it immediately, when you win with the king, queen, or knave, and have only small ones, or when you have a good sequence, have a strong suit, or have five trumps.

(10.) Do not lead from ace queen, or ace knave.

(11.) Do not lead an ace, unless you have a king.

(12.) Do not lead a thirteenth card, unless trumps be out.

(13.) Do not trump a thirteenth card, unless you be last player, or want the lead.

(14.) Keep a small card to return your partner's lead.

(15.) Be cautious in trumping a card when strong in trumps, particularly if you have a strong suit.

(16.) Having only a few small trumps, make them when you can.

(17.) If your partner refuses to trump a suit, of which he knows you have not the best, lead your best trump.

(18.) When you hold all the remaining trumps play one, and then try to put the lead in your partner's hand.

(19.) Remember how many of each suit are out, and what is the best card left in each hand.

(20.) Never force your partner if you are weak in trumps, unless you have a renounce, or want the odd trick.

(21.) When playing for the odd trick, be cautious of trumping out, especially if your partner be likely to trump a suit; make all the tricks you can early, and avoid finessing.

(22.) If you take a trick, and have a sequence, win with the lowest.

FOR SECOND HAND

(23.) With king, queen, and small cards, play a small one, when not strong in trumps. But if weak, play the king. With ace, king, queen, or knave, only, and a small card, play the small one.

FOR THIRD HAND

(24.) With ace and queen, play her majesty, and, if she wins, return the ace. In all other cases the third hand should play his best card when his partner has led a low one. It is a safe rule for the third hand to play his highest.

FOR ALL THE PLAYERS

(25.) Fail not, when in your power, to make the odd trick.

(26.) Attend to the game, and play accordingly.

(27.) Hold the turn-up card as long as possible, and so keep your adversaries from a knowledge of your strength.

(28.) Retain a high trump as long as you can.

(29.) When in doubt win the trick.

(30.) *Play the game fairly and keep your temper.*

CUTTING IN

(31.) The highest two are partners against the lowest two.

(32.) Less than three cards is not a cut.

[If fewer than three cards be cut off the pack, the player so cutting must replace the cards, and cut again.]

(33.) In cutting, the ace is lowest.

(34.) Ties must cut again.

(35.) After the pack is cut, no fresh cards can be called for in that deal.

(36.) If a card be exposed, a new cut may be demanded.

(37.) All cutting-in and cutting-out must be by pairs.

(38.) The right-hand adversary cuts to the dealer.

SHUFFLING

(39.) The cards must be shuffled above the table.

(40.) Each player has a right to shuffle the cards, the dealer last.

DEALING

(41.) The cards must be dealt one at a time, commencing with the player to the left of the dealer.

(42.) In case of a misdeal, the deal passes to the next player.

[The following are *misdeals*:—A card too many or too few given to either player. An exposed card. Looking to the trump card before it is turned up in the regular order of play. Dealing the cards with the pack not having been cut. The trump card dropped out of turn. A faulty pack. In every case, except the last, the deal is lost if a fresh deal be claimed by opponents. A card faced by any other than the dealer is not subject to penalty.]

(43.) The dealer must not touch the cards after they have left his hand, but he is allowed to count those remaining undealt if he suspects he has made a misdeal.

(44). The trump card must be left on the table, face upward, till the first trick is turned.

[If it is not then taken up, however, it can be treated as an exposed card, and called at any part of the game, provided that no revoke be made by playing it.]

(45). One partner may not deal for another without the consent of opponents.

THE GAME

(46). Any card played out of turn can be treated as an exposed card and called, provided no revoke be thereby caused.

[Thus, a player who wins a trick plays another card before his partner plays to the trick. The second card becomes an exposed card.]

(47.) If the third player throws down his card before the second, the fourth player has a right also to play before the second; or, if the fourth hand play before the second or third, the cards so played must stand, and the second be compelled to win the trick if he can.

(48.) No player but he who made the last trick has a right to look at it after it has been turned.

(49.) A trump card played in error may be recalled before the trick is turned.

[But if the playing of such trump cause the next player to expose a card, such last exposed card can not be called.]

(50.) If two cards be played, or if the player play twice to the same trick, his opponents can elect which of the two shall remain and belong to the trick. Provided, however, that no revoke be caused.

[But if the trick should happen to be turned with five cards in it, adversaries may claim a fresh deal.]

(51.) A player, before he throws, may require his partner to "draw his card," or he may have each card in the trick claimed by the players before the trick is completed.

[The proper way is to say, "Draw your cards," as then the chance of partner claiming the wrong one is lessened.]

(52.) If two players answer the lead together, the one whose turn it was to play can call the other card in the next or following trick as an exposed card.

(53.) No player is allowed to transfer his hand to another without the consent of his adversaries.

(54.) A hand once abandoned and laid down on the table can not be taken up again and played.

(55.) If a player announce that he can win every trick, adversaries may call his cards.

THE REVOKE

(56.) The penalty for a revoke is the forfeiture of three tricks. If a revoke be made, the adverse party may add three to their score by taking them from their opponents, or they may reduce your score by three.

[In order to more fully explain the intent of a revoke: "If a suit is led, and any one of the players, having a card of the same suit, shall play another suit to it—that constitutes a revoke. But if the error be discovered before the trick is quitted, or before the party having so played a wrong suit, or his partner, shall play again, the penalty only amounts to the cards being treated as exposed, and being liable to be called."]

(57.) If a player revoke, and before the trick is turned discovers his error, adversaries may call on him to play his highest or lowest card of the suit led, or they may call the card exposed at any time when such call will not lead to another revoke.

(58.) No revoke can be claimed till the trick is turned and quitted, or the revoker's partner has played again.

(59.) When a revoke is claimed, the cards must not be mixed, under forfeiture of the game.

(60.) The player or partners against whom a revoke is established can not claim the game in that deal.

(61.) No revoke can be claimed after the cards are cut for the next game.

(62.) When a revoke has occurred on both sides, there must be a new deal.

(63.) The proof of a revoke is with the claimants, who may examine each trick on the completion of the round.

CALLING HONORS

(64.) Honors can not be counted unless they are claimed before the next deal. No omission to score them can be rectified after the cards are packed, but an overscore can be deducted.

(65.) Honors can only be called at eight points, and then only by the player whose turn it is to play.

[It is quite usual to omit calling honors when the game is pretty certain, but the shortest and fairest plan is for the player holding two honors to ask, "Can you one?" when, if your partner holds one, the game is at an end.]

(66.) At nine points honors do not count.

(67.) Four honors in one or both partners' hands count *four* to the game; three honors, *two*. Two honors on each side are not scored, but are said to be *divided*.

THE SCORE

(68.) If both partners score, and a discrepancy occur between them, adversaries may elect which score to retain.

(69.) The score can not be amended after the game is won and the cards packed.

INTIMATIONS BETWEEN PARTNERS

(70.) A player may ask his partner, "What are trumps?" or, "Can you follow suit?" "Is there not a revoke?" Or he may tell him to draw his card. All other intimations are unfair.

(71.) Lookers-on must not interfere unless appealed to.

THE LEAD—FIRST HAND

Begin with the suit of which you have the greatest number; for, when trumps are out, you will probably make the tricks in it.

If you hold equal numbers in different suits, begin with the strongest; it is the least liable to injure your partner.

Sequences are always eligible leads; they support your partner's hand without injuring your own.

Lead from king or queen rather than from a single ace; for, since your opponents will lead from contrary suits, your ace will be powerful against them.

Lead from king rather than queen, and from queen rather than knave; for the stronger the suit, the less is your partner endangered.

Do not lead from ace queen, or ace knave, till you are obliged; for, if that suit be led by your opponents, you have a good chance of making two tricks in it.

In sequences to a queen, knave, or ten, begin with the highest, and so distress your left-hand adversary.

With ace, king, and knave, lead the king; if strong in trumps, you may wait the return of this suit, and finesse the knave.

With ace, queen, and one small card, lead the small one; by this lead, your partner has a chance of making the knave.

With ace, king, and two or three small cards, play ace and king if weak, but a small card if strong, in trumps; when strong in trumps, you may give your partner the chance of making the first trick.

With king, queen, and one small card, play the small one; for your partner has an equal chance to win, and there is little fear of your making king or queen.

With king, queen, and two or three small cards, lead a small card if strong, and the king if weak, in trumps; strength in trumps entitles you to play a backward game, and to give your partner a chance of winning the first trick. But if weak in trumps, lead the king and queen, to secure a trick in that suit.

With ace, with four small cards, and no other good suit, play a small one if strong in trumps, and the ace if weak; strength in trumps may enable you to make one or two of the small cards, although your partner can not support your lead.

With king, knave, and ten, lead the ten; if your partner has the ace, you may probably make three tricks, whether he pass the ten or not.

With king, queen, and ten, lead the king; for, if it fail, by putting on the ten, upon the return of the suit from your partner, you may make two tricks.

With queen, knave, and nine, lead the queen; upon the return of that suit from your partner, by putting on the nine, you make the knave.

SECOND HAND

With ace, king, and small ones, play a small card if strong in trumps, but the king if weak. Otherwise your ace or king might be trumped in the latter case. Except in critical cases no hazard should be run with few trumps.

With ace, queen, and small cards, play a small one; upon the return of that suit you may make two tricks.

With ace, knave, and small cards, play a small one; upon the return of that suit you make make two tricks.

With ten or nine, with small cards, play a small one. By this plan you may make two tricks in the suit.

With king, queen, ten, and small cards, play the queen. By playing the ten on the return of the suit you stand a good chance of making two tricks.

With king, queen, and small cards, play a small card if strong in trumps, but the queen if weak in them; for strength in trumps warrants a backward game. It is advantageous to keep back your adversaries' suit.

With a sequence to your highest card in the suit, play the lowest of it, for by this means your partner is informed of your strength.

With queen, knave, and small ones, play the knave, because you will probably secure a trick.

With queen, ten, and small ones, play a small one, for your partner has an equal chance to win.

With either ace, king, queen, or knave, with small cards, play a small one; your partner has an equal chance to win the trick.

With either ace king, queen, or knave, with one small card only, play the small one, for otherwise your adversary will finesse upon you.

If a queen of trumps be led, and you hold the king, put that on; if your partner hold the ace, you do no harm; and if the king be taken, the adversaries have played two honors to one.

If a knave of trumps be led, and you hold the queen, put it on; for, even at the worst, you bring down two honors for one.

If a king be led, and you hold ace, knave, and small ones, play the ace, which can only make one trick.

THIRD HAND

The third hand plays high.

With ace and king, play the ace and immediately return the king. It is not necessary that you should keep the command of your partner's hand.

With ace and queen, play the ace and return the queen. By this means you make a certain trick, though it is sometimes policy to play the queen. Your partner is, however, best supported by the old-fashioned method.

With ace and knave, play the ace and return the knave, in order to strengthen your partner's hand.

With king and knave, play the king; and if it win, return the knave.

Play the best when your partner leads a small card, as it best supports him.

If you hold ace and one small card only, and your partner lead the king, put on the ace, and return the small one; for, otherwise, your ace may be an obstruction to his suit.

If you hold king and only one small card, and your partner lead the ace, when the trumps are out, play the king; for, by putting on the king, there will be no obstruction to the suit.

FOURTH HAND

If a king be led, and you hold ace, knave, and a small card, play the small one; for supposing the queen to follow you will probably make both ace and knave.

When the third hand is weak in his partner's lead, you may often return that suit to great advantage; but this rule must not be applied to trumps, unless you are very strong indeed.

Never neglect to secure the trick if there is any doubt about the game.

If you hold the thirteenth trump, retain it to make a trick when your partner fails in his lead.

If you stand in the nine holes, make all the tricks you can; but at the same time be careful. Watch the game narrowly, and look well to your partner's lead.

LEADING TRUMPS

Lead trumps from a strong hand, but never from a weak one; by which means you will secure your good cards from being trumped.

Never trump out with a bad hand, although you hold five small trumps; for, since your cards are bad, you only bring out your adversaries' good ones.

If you hold ace, king, knave, and three small trumps, play ace and king; for the probability of the queen falling is in your favor.

If you hold ace, king, knave, and one or two small trumps, play the king, and wait the return from your partner to put on the knave. By this plan you may win the queen. But if you have particular reasons to exhaust trumps, play two rounds, and then your strong suit.

If you hold ace, king, and two or three small trumps, lead a small one, with a view to letting your partner win the first trick; but if you have good reason for getting out trumps, play three rounds, or play ace and king, and then your strong suit.

If your adversaries are eight, and you hold no honor, throw off your best trump; for if your partner has not two honors, you lose the game. But if he should happen to hold two honors—as he probably would—you have a strong commanding game.

Holding ace, queen, knave, and small trumps, play the knave; by this means, the king only can make against you.

Holding ace, queen, ten, and one or two small trumps, lead a small one; this will give your partner a chance to win the first trick, and keep the command in your own hand.

Holding king, queen, ten, and small trumps, lead the king; for, if the king be lost, upon the return of trumps you may finesse the ten.

Holding king, knave, ten, and small ones, lead the knave; it will prevent the adversaries from making a small trump.

Holding queen, knave, nine, and small trumps, lead the queen; if your partner hold the ace, you have a chance of making the whole suit.

Holding queen, knave, and two or three small trumps, lead the queen.

Holding knave, ten, eight, and small trumps, lead the knave; on the return of trumps, you may finesse the eight.

Holding knave, ten, and three small trumps, lead the knave; this will most distress your adversaries, unless two honors are held on your right hand, the odds against which are about three to one.

Holding only small trumps, play the highest; by which means you support your partner.

Holding a sequence, begin with the highest; thus your partner is instructed how to play his hand, and can not be injured.

If any honor be turned up on your left, and the game much against you, lead a trump as soon as you can. If you do this you may probably retrieve an almost lost game.

In all other cases it is dangerous to lead through an honor without you are strong in trumps, or have an otherwise good hand. All the advantage of leading through an honor lies in your partner finessing.

If the queen be turned up on your right, and you hold ace, king, and small ones, lead the king. Upon the return of trumps finesse, unless the queen falls. Otherwise the queen will make a trick.

With the knave turned up on your right, and you holding king, queen, and ten, the best play is to lead the queen. Upon the return of trumps play the ten. By this style of play you make the ten.

If the knave turn up on your right, and you hold king, queen, and small ones, it is best to lead the king. If that come home, you can play a small one, for the chance of your partner possessing the ace.

If knave turn up on your right, and you have king, queen, and ten, with two small cards, lead a small one. Upon the return of trumps, play the ten. The chances are in favor of your partner holding an honor, and thus you make a trick.

If an honor be turned up on your left, and you hold only one honor with a small trump, play out the honor, and then the small one. This will greatly strengthen your partner's hand, and can not injure your own.

If an honor be turned up on the left, and you hold a sequence, lead the highest; it will prevent the last hand from injuring your partner.

If a queen be turned up on the left, and you hold ace, king, and a small one, lead the small trump; you have a chance for winning the queen.

If a queen be turned up on your left, and you hold knave, with small ones, lead the knave; for the knave can be of no service, since the queen is on your left.

If an honor be turned up by your partner, and you are strong in trumps, lead a small one; but if weak in them, lead the best

you have. By this means the weakest hand supports the strongest.

If an ace be turned up on the right, and you hold king, queen, and knave, lead the knave; it is a secure lead.

If an ace be turned up on the right, and you hold king, queen, and ten, lead the king; and upon the return of trumps, play the ten. By this means you show strength to your partner, and probably make two tricks.

If a king be turned up on the right, and you hold queen, knave, and nine, lead the knave, and upon the return to trumps, play the nine: it may prevent the ten from making.

If a king be turned up on your right, and you hold knave, ten, and nine, lead the nine; upon the return of trumps, play the ten. This will disclose your strength in trumps to your partner.

If a queen be turned up on the right, and you have ace, king, and knave, lead the king. Upon the return of trumps, play the knave, which makes a certain trick.

HOW TO PLAY WHEN YOU TURN UP AN HONOR

If you turn up an ace, and hold only one small trump with it, if either adversary lead the king, put on the ace.

But if you turn up an ace, and hold two or three small trumps with it, and either adversary lead the king, put on a small one; for, if you play the ace, you give up the command in trumps.

If you turn up a king and hold only one small trump with it, and your right-hand adversary lead a trump, play a small one.

If you turn up a king, and hold two or three small trumps with it, if your right-hand adversary lead a trump, play a small one.

If you turn up a queen or knave, and hold besides only small trumps, if your right-hand adversary lead a trump, put out a small one.

If you hold a sequence to the honor turned up, play it last.

HOW TO PLAY FOR THE ODD TRICK

Never trump out if you can avoid it, for you can hardly be sure of the other three hands.

If your partner, by hoisting the blue peter, or by any other allowable intimation, shows that he has means of trumping any suit, be cautious how you trump out. Force your partner, if strong in trumps, and so make all the tricks you can.

Make tricks early in the game, and be cautious in finessing.

With a single card of any suit, and only two or three small trumps, lead the single card.

RETURNING PARTNER'S LEAD

In the following cases it is best to return your partner's lead directly:

When you win with the ace, and can return an honor; for then it will greatly strengthen his hand.

When he leads a trump, in which case return the best remaining in your hand unless you hold four. An exception to this arises if the lead is through an honor.

When your partner has trumped out; for then it is evident he wants to make his strong suit.

When you have no good card in any other suit; for then you are entirely dependent on your partner.

In the following instances it is proper that you should NOT *return your partner's lead immediately:*

When you win with the king, queen, or knave, and have only small cards remaining. The return of a small card will more distress than strengthen your partner's hand.

When you hold a good sequence; for then you may make tricks and not injure his hand.

When you have a strong suit. Leading from a strong suit is a direction to your partner and can not injure him.

When you have a good hand; for in this case you have a right to consult your own hand, and not your partner's.

When you hold five trumps; for then you are warranted to play trumps if you think it right.

When, in fine, you can ensure two or three tricks, play them, and then return the lead. With a leading hand, it is well to play your own game.

THE FINISH

The most important part of a game at whist is the finish—the last two or three tricks. Be careful how you play, or you may make a bad ending to a good beginning.

LOOSE CARD.—If you hold three winning cards and a loose one, play the latter, and trust to your partner.

LOOSE TRUMP AND TENACE.—Holding these, play the loose trump.

KING AND THE LEAD.—If you hold a king, and a loose card, the best plan is to play the last, so that your partner may lead up to your king.

LONG TRUMPS.—If you hold three, it is best to lead the smallest; by this means you

give your partner a chance of making tricks, and still hold a commanding card in your own hand. It is not well to play out the king card.

THIRD HAND WITH KING, ETC.—"Supposing," says Cœlebs, "ten tricks being made, you remain with the king, ten, and another. If second hand plays an honor cover it; otherwise finesse the ten for a certain trick. If you want two tricks play your king."

RUNNING A CARD.—The same authority says: "With such cards as knave, nine, eight, against ten guarded, by 'running' the eight you make every trick."

STRENGTH IN TRUMPS

The following hands are given by Hoyle to demonstrate what is known as being strong in trumps:

Ace, king, and three small trumps.
King, queen, and three small trumps.
Queen, ten, and three small trumps.
Queen and four small trumps.
Knave and four small trumps.
Five trumps without an honor must win two tricks if led.

FORCING YOUR PARTNER

You are justified in forcing your partner if you hold—

Ace and three small trumps.
King and three small trumps.
Queen and three small trumps.
Knave and four small trumps.
Five trumps.

CALCULATIONS ON HANDS HELD

At long whist.

It is about five to four that your partner holds one card out of any two.

Five to two that he holds one card out of any three.

Two to one that he does not hold a certain named card.

Three to one that he does not hold two out of three named cards in a suit.

Three to two that he does not hold two cards out of any four named.

Five to one that your partner holds one winning card.

Four to one that he holds two.
Three to one that he holds three.
Three to two that he holds four.
Four to six that he holds five.

SHORT WHIST, DUMMY, ETC.

THE LAWS OF SHORT WHIST

(1.) The game consists of five points. One point scored saves the triple game; three points, a double. The rubber is reckoned as two points.

[Eight points may therefore be gained in a single rubber.]

(2.) Honors can not be "called" at any part of the game, and do not count at the point of four.

[In all other respects, honors are reckoned as in long whist.]

(3.) The highest two and lowest two are partners, the lowest cut having the deal.

[The cards are to be shuffled and cut in precisely the same way as in the old-fashioned game.]

(4.) An exposed card necessitates a fresh deal.

(5.) In cases of misdeal, the deal passes to the next player.

[Misdeals occur from precisely the same causes as in long whist, and need not, therefore, be stated.]

(6.) No questions as to either hand can be asked after the trick is turned.

[Nor are any questions except those admissible in the other game to be asked.]

(7.) Any card played out of turn, or shown accidentally, can be called.

(8.) A revoke is subject to the penalty of three tricks.

[Taken as in long whist.]

(9.) The side making the revoke remains at four, in whatever way the penalty be enforced.

It is not necessary to dilate upon the best method of playing each separate hand at this game, because whatever is useful and true at long whist is equally useful and true at short whist. The only advantage of the short game lies in the more forcible use that can be made of trumps. "Trumps," says Carleton, "should be your rifle company; use them liberally in your manœuvres; have copious reference to them in finessing, to enable you to maintain a long suit. Should you be weak in trumps, ruff a doubtful card at all times; with a command in them, be very chary of that policy.

Let your great principle always be to keep the control of your adversaries' suit, and leave that of your partner free. If you see the probable good effect of forcing, decide which of your adversaries you will assail, but do not attempt them both at once. Let it be the stronger if possible. When you force both hands opposed to you, one throws away his useless cards; while the chance is, the other makes trumps that, under other circumstances, would have been sacrificed."

DUMMY, OR THREE-HANDED WHIST

This game is precisely the same as long whist, only that one player takes two hands, one of which he holds in the usual manner, and the other he spreads open on the table. The rules are the same.

ANOTHER GAME is played by three persons, in which two nines and fours, and one of the five is cast out from the pack, and each player plays on his own account.

A THIRD WAY of playing three-handed whist is to reject the fourth hand altogether, and allow it to remain unseen on the table. Each player then takes the miss, or unseen hand, in exchange for his own, if he thinks fit. Each player stands on his cards, and the best hand must win. There is, however, room for finesse, and the plaver who sees two hands—the miss, and that first dealt to him—has an undeniable advantage.

TWO-HANDED WHIST

This game is either played as double dummy, by exposing two hands and playing as with four players, or by rejecting two hands and each player making the best he can of his own hand. In these games each honor counts as one point in the game. There is but small room for skill in any of the imperfect whist games, and the player who is acquainted with the real old-fashioned game need not be told how to play his cards at dummy or French humbug. At best these games are inferior to cribbage, ecarté, all-fours, or any of the regular two-handed games.

EUCHRE, ITS RULES AND VARIATIONS

EUCHRE is played with a pack of thirty-two cards, all below the seven being rejected. Two, three, or four persons may play, but the four-handed game is the best.

THE DEAL

The players having cut for deal, the pack is shuffled and the player to the right of the dealer cuts. The deal is executed by giving five cards to each player. The dealer gives two cards at a time to each in rotation, beginning with the player to his left; he then gives three cards at a time to each, or *vice versa*. In whichever manner the dealer commences to distribute the cards, he must continue; he must not deal two to the first, three to the next, and so on. After each player has received five cards, the dealer turns up the next card for trumps, and places it face upward on top of the stack.

The right to deal passes successively to the left.

At the outset of the game each player cuts for the deal, and the lowest cut deals. In a tie, the parties tied cut again. The players cutting the highest two cards play against those cutting the lowest two.

In cutting, the ace is lowest, and the other cards rank as at whist.

Should a player expose more than one card, he must cut again.

The cards may be shuffled by any player who demands that privilege, but the dealer has always the right to shuffle last.

The cards must be cut by the right-hand opponent before they are dealt.

A cut must not be less than four cards removed from the top, nor must it be made so as to leave less than four cards at the bottom; and the pack must be put on the table for the cut.

RANK

The cards in suits, not trumps, rank as at whist, the ace being the highest, the seven the lowest. When a suit is trump, the cards rank differently. The knave of the suit turned up is called the *right bower*, and is the highest trump. The other knave of the same color (black or red, as the case may be) is called the *left bower*, and is the next highest trump.

ORDER UP, ASSIST, PASS, AND TAKE UP

When the trump is turned, the player to the left of the dealer examines his hand to determine his plans. He may either order up the trump, or pass. If he thinks his cards are strong enough to win three tricks, he says, "I order it up." The dealer then discards one card from his hand, and puts it under the stack face downward, and the trump card belongs to the dealer, instead of the card he discarded. If the eldest hand is not satisfied with his cards, he says, "I pass."

If the eldest hand pass, the partner of the dealer then has the option of declaring what

he will do, and he may either assist his partner, or pass. If his hand is strong enough, with the help of the trump his partner has turned, to win three tricks, he says, "I assist," and his partner discards as before, and the trump card belongs to him. If the partner of the dealer has a weak hand, he says, "I pass," and the third player, that is, the player next to the right of the dealer, has the option of saying what he will do.

The third player proceeds exactly as the eldest hand, and, if he pass, the dealer has the next say.

If all the other players pass, the dealer may either take up the trump or pass. If his hand is strong enough to take three tricks, he says, "I take it up." The dealer then discards the weakest card from his hand, and takes the trump card instead. If the dealer has a weak hand, he says, "I turn it down," and, at the same time, places the trump card face up under the stack.

If the dealer turns down the trump, the eldest hand has the option of naming any suit (except the one turned down) for trumps, or of passing again. If he pass, he says, "I pass the making."

If the eldest hand pass the making, the partner of the dealer then has the option of making the trump, and so on in rotation up to and including the dealer.

If all the players, including the dealer, decline to make the trump, a fresh deal takes place, and the eldest hand deals.

If either side adopt (play with the suit turned up for trump) or make the trump, the play of the hand commences.

When the trump is made of the same color as the turn up (that is, black, if the turn up is black, or red, if it is red), it is called *making it next in suit.*

If the trump is made of a different color from the turn up, it is called *crossing the suit.*

WHEN TO PLAY ALONE

If a player holds a hand so strong that he has a reliable hope of taking all five tricks without the assistance of his partner, he may *play alone.* If he plays without his partner, he says, *"I play alone."* His partner then places his cards face downward on the table, and makes no sign.

If the eldest hand order up, or make the trump, either he or his partner may play alone. If the dealer's partner assist, or make the trump, either he or the dealer may play alone. If the player to the right of the dealer order up or make the trump, he may play alone (but his partner can not). If the dealer take up or make a trump, he may play alone (but his partner can not).

A player can not play alone after having passed a trump, or passed the making of a trump. A player can not play alone when the opposing side adopt or make the trump; nor can he play alone unless he announce his intentions to do so before he or the opposing side make a lead.

THE PLAY

The eldest hand leads a card and each player in rotation plays a card to the lead. The four cards thus played constitute a trick. A player must follow suit if he can, but if not able to follow suit he may play any card he chooses.

The highest card of the suit led wins the trick; trumps win all other suits. The winner of the trick leads to the next, and so on until the five tricks are played.

THE SCORE

The game is five points, although of late it has become customary to play games f ten points.

If the side who adopt, or make a trump, win all five tricks, they make a *march,* and score two.

If they win three tricks, they make the *point,* and score one. Four tricks count no more than three tricks.

If they fail to take three tricks they are euchred, and the opposing side scores two points.

When a player plays alone and takes all five tricks, he scores four points.

If he takes three tricks he scores one point. If he fails to take three tricks he is euchred, and the opposing side scores two points. By some rules, to euchre a lone hand counts the opposing side four points.

Cards are used in marking game. The face of the three being up, and the face of the four down on it, counts *one,* whether one, two, or three pips are exposed; the face of the four being up, and the three over it, face down, counts *two,* whether one, two, three, or four of the pips are shown; the face of the three uppermost counts *three;* and the face of the four uppermost counts *four.*

GOLDEN MAXIMS

Never lose sight of the state of the game. When you are four and four, adopt or make the trump upon a weak hand.

When the game stands three to three,

reflect before you adopt or make a trump upon a weak hand, for a euchre will put your adversaries out.

When you are one and your opponents have scored four, you can afford to try and make it alone upon a weaker hand than if the score were more in your favor.

When you are eldest hand, and the score stands four for you and one for your opponents, do not fail to order up the trump, to prevent them from playing alone. This is called a "bridge." You need not do this if you hold the right bower, or the left bower guarded.

Never trump your partner's winning cards, but throw your losing and single cards upon them.

If your partner adopts or makes the trump, and you hold the right or left bower alone, ruff with it as soon as you can get the opportunity.

When playing second, be careful how you ruff a card of a small denomination the first time round, for it is an even chance that your partner will be able to take the trick if you let it pass. Throw away any single card lower than an ace, so that you may ruff the suit you throw away when it is led.

When your partner assists, and you hold a card next higher to the turn-up card, ruff with it when an opportunity occurs, for by so doing you give your partner information of value.

When you are in the position of third player, ruff with high or medium trumps.

When your partner leads a lay ace, and you have none of that suit, do not trump it; but if you have a single card, throw it away upon it.

When second hand, if compelled to follow suit, head the trick if possible, to strengthen your partner's game.

When you can not follow suit or trump, dispose of your weakest card.

When opposed to a person playing it alone, be careful how you separate two cards of the same suit. Be cautious how you separate your trumps when you hold the left bower guarded.

When it comes your turn to say what you will do, decide promptly, saying, "I pass," "assist," etc., at once.

In discarding, endeavor to keep as few suits as possible.

EUCHRE WITH THE JOKER

A euchre pack is usually accompanied by a specimen blank card, which has given rise to this amusing variety of the game of euchre. It is called "the joker," or highest trump card, and ranks above the right bower. If this "joker" should happen to be turned for trump, the dealer must turn up the next card to determine the trump suit. In all other particulars the game is played in the same manner as the regular game of euchre.

TWO-HANDED EUCHRE

The rules of the four-handed game apply equally to two-handed euchre.

The player, remembering that he has but a single hand to contend against, may play, or even order up, if he has a reasonable hope of making three tricks.

MISDEALS

A card too many or too few given to either player.

Dealing the cards when the pack has not been properly cut; the claim for a misdeal in this case must be made before the trump card is turned, and before the adversaries look at their cards.

Whenever a misdeal is attributable to any interruption by the adversaries, the deal will not be forfeited.

If, during the deal, a card be exposed by the dealer or partner, should neither of the adversaries have touched their cards, the latter may claim a new deal, but the deal is not lost.

If, during the deal, the dealer's partner touch any of his cards, the adversaries may do the same without losing their privilege of claiming a new deal should chance give them that option.

If an opponent displays a card dealt, the dealer may make a new deal, unless he or his partner have examined their own cards.

If a deal is made out of turn, it is good, provided it be not discovered before the dealer has discarded, and the eldest hand has led.

If a card is faced in dealing, unless it be the trump card, a new deal may be demanded, but the right to deal is not lost.

If the pack is discovered to be defective, by reason of having more or less than thirty-two cards, the deal is void; but all the points before made are good.

The dealer, unless he turn down the trump, must discard one card from his hand and take up the trump card.

The discard is not complete until the dealer has placed the card under the pack; and if the eldest hand makes a lead before the discard is complete, he can not take back the card thus led, but must let it remain. The dealer, however, may change

the card he intended to discard and substitute another, or he may play alone, notwithstanding a card has been led. After the dealer has quitted the discarded card, he can not take it back under any circumstances.

After the discard has been made, the dealer may let the trump card remain upon the table until it is necessary to play it. After the trump card has been taken in hand, no player has a right to demand its denomination, but he may ask what card is trump, and the dealer must inform him.

Should a player play with more than five cards, or the dealer forget to discard or omit to declare the fact before three tricks have been turned, the offending party is debarred from counting any points made in that deal, under these circumstances. Should the adverse side win, they may score all the points they make.

PLAY OUT OF TURN, AND EXPOSURE OF CARDS

All exposed cards may be called, and the offending party compelled to lead or play the exposed card or cards when he can legally do so, but in no case can a card be called if a revoke is thereby caused.

EXPOSED CARDS

Two or more cards played at once.

If a player indicates that he holds a certain card in his hand.

Any card that is dropped with its face upward.

All cards exposed, by accident or otherwise, so that an opponent can distinguish and name them.

If any player lead out of turn, his adversaries may demand of him to withdraw his card, and the lead may be compelled from the right player, the card improperly led be treated as an exposed card, and called at any time during that deal, provided it causes no revoke.

If any player lead out of turn, and the mislead is followed by the other three, the trick stands good; but if only the second, or the second and third, have played to the false lead, their cards, on discovery of their mistake, are taken back, and there is no penalty save against the original offender, whose card may be called.

If a player play out of turn, his opponents may compel him to withdraw his card, and the card so played may be treated as an exposed card, and called at any time during that deal, provided no revoke is thereby caused.

If any player trump a card in error, and thereby induce an opponent to play otherwise than he would have done, the latter may take up his card without penalty, and may call upon the offender to play the trump at any period of the hand.

If two cards be played, or if the player play twice to the same trick, his opponent can elect which of the two shall belong to the trick, provided, however, that no revoke be caused.

If a player, imagining that he can take every trick, or for any other reason, throw down his cards upon the table with their faces exposed, the adverse side may call each and all of the cards so exposed, as they may deem most advantageous to their game, and the delinquent party must play the exposed cards accordingly. This, however, in the case of a lone hand only.

REVOKE

When a revoke takes place, the adverse party are entitled to add two points to their score.

If a suit is led, and any one of the players, having a card of the same suit, shall play the card of another suit to it—that constitutes a revoke. But if the error be discovered before the trick is quitted, or before the party having so played a wrong suit, or his partner, shall play again, the penalty only amounts to the cards being treated as exposed, and being liable to be called.

When the player who has made a revoke corrects his error, his partner, if he has played, can not change his card played; but the adversary may withdraw his card and play another if he elects to do so.

When a revoke is claimed against adversaries, if they mix their cards, or throw them up, the revoke is taken for granted, and they lose the two points.

No party can claim a revoke after cutting for a new deal.

A revoke on both sides causes forfeit to neither; but a new deal must be made.

If a player makes a revoke, his side can not count any point or points made in that hand.

A party, refusing to play an exposed card on call, forfeits two to his opponents.

MAKING THE TRUMP, PLAYING ALONE

Any player making a trump can not change the suit after having once named it; and if he should by error name the suit previously turned down, he forfeits his right to make the trump, the privilege passing to the next eldest player.

A player may only play alone when he orders up, takes up, or makes a trump; or when his partner assists, orders up, or makes a trump. He can not play alone with a trump he has passed, or with a trump the making of which he has passed; nor can he play alone after a lead has been made either by himself or by his opponents.

A player can not play alone when he or his partner is ordered up by an opponent, or when the opposite side adopt or make the trump.

When a player, having the right to play alone, resolves to do so, his partner can not thereafter supersede him, and play alone instead.

When a player announces that he will go it alone, his partner must place his cards upon the table face downward, and should the latter expose the face of any of his cards, either by accident or design, his opponents may compel him to play or not to play with his partner, at their option.

A player who goes alone must announce his intention in a clear and audible tone, so that no doubt can be entertained of his design.

DELICATE HINTS BETWEEN PARTNERS

If a partner indicates his hand by words or gestures to his partner, directs him how to play, even by telling him to follow the rules of the game, or in any way acts out of order, the adversary scores one point.

If a player, when his side is at a bridge, call the attention of his partner to the fact, so that the latter orders up, the latter forfeits the right to order up, and either of the opponents may play alone, if they choose so to do.

No player has a right to see any trick but the one last turned.

THE NATIONAL GAME OF DRAW POKER

IT requires a pack of fifty-two cards to play this game, and any number of persons from two to six.

THE DEAL

Before the dealer begins to deal the cards, the player next to his left, who is called the *ante-man,* or *age,* must deposit in the pool an *ante* not exceeding one-half the limit previously agreed upon; this is called a *blind.*

The deal is executed by giving five cards to each player, one at a time, beginning with the player to the left of the dealer.

THE ORIGINAL HAND

After the cards have been dealt the players consult their hands, and each player, in rotation, beginning with the player to the left of the age, determines whether he will *go in* or not. Any player who decides to go in—that is, to play for the pool—must put into the pool double the amount of the ante, except the player holding the age, who contributes the same amount as his original ante.

Those who declare they will not play throw their cards, face downward, upon the table in front of the next dealer.

Any player, when it is his turn, and after making the ante good, may *raise, i. e.,* increase the ante any amount within the limit of the game; the next player, after making good the ante and raise, may then also raise it any amount within the limit; and so on. Each player as he makes good and pays a share that equalizes his with the other players who are in before him, may thus increase the ante if he chooses, compelling the others to pay up that increase, or abandon their share of the pool.

Each player who raises the ante must do so in rotation, going round to the left, and any player who remains in to play must put in the pool as much as will make his stake equal to such increase, or abandon everything which he has already contributed to the pool.

STRADDLE

When betting upon the *original hand,* the *straddle* may be introduced. The straddle is nothing more than a double blind.

The straddle does not give a player the age, it only gives him the first opportunity to be the last in before the draw; that is, the player to the left of the last straddler, after looking at his hand, and before the draw, must be the first to declare whether he will make good the straddle, and so on, in rotation, up to the player who made the last straddle. After the draw, the player to the left of the age must make the first bet, provided he remains in.

FILLING THE HANDS

When all are in who intend to play, each player has the right to draw any number of cards he chooses, from one to five, or he can retain the cards originally dealt to him. If a player draws cards, he must discard a like number from his hand previous to drawing, and the rejected cards must be placed face downward upon the table near the next dealer.

The dealer asks each player in rotation, beginning with the holder of the age, how many cards he wants, and, when the player has discarded, he gives the number requested from the top of the pack. When the other hands have been helped, the dealer, if he has "gone in," and wants cards, then helps himself last.

BET, RAISE, AND CALL

When all the hands are filled, the player to the left of the age has the first say, and he must either bet or retire from the game, forfeiting what he has already staked. The same with all the other players, in rotation, up to the age. When a player makes a bet, the next player must either *see him*—that is, put in the pool an equal amount, or *go better*—that is, make the previous bet good, and raise it any amount not exceeding the limit; or he must retire. This continues either until some one player drives all the others out of the game, and takes the pool without showing his hand; or until all the other players who remain in see the last raise (no one going better) and call the player who made the last raise. In this event, that is, when a call is made, the players remaining in all show their hands, and the strongest hand takes the pool.

If all the players pass, up to the age, the latter takes the pool, and the deal ends.

VALUE

One Pair.—If two players each hold a pair, the higher pair wins; if the two are similar, the highest remaining card wins.

Two Pairs.—If the players each hold two pairs, the highest pair wins. If the two pairs are similar, the player whose remaining card is the highest wins.

Triplets.—Three cards of the same denomination, not accompanied by a pair. The highest triplet wins. Triplets beat two pairs.

A Straight.—A sequence of five cards not all of the same suit. An ace may either begin or end a straight. If more than one player holds a straight, the straight headed by the highest card wins. A straight will beat triplets.

A Flush.—Five cards of the same suit, not in sequence. If more than one player holds a flush, the flush containing the highest card wins; if the highest cards tie, the next highest cards in those two hands win, and so on. A flush will beat a straight, and, consequently, triplets.

A Full.—Three cards of the same denomination and a pair. If more than one player holds a full, the highest triplets win. A full will beat a flush.

Fours.—Four cards of the same denomination, accompanied by any other card. If more than one player holds fours, the highest fours win. When straights are not played, fours beat a straight flush.

A Straight Flush—A sequence of five cards, all of the same suit. If more than one player holds a straight flush, the winning hand is determined in the same manner as the straight, which see.

When none of the foregoing hands are shown, the highest card wins; if these tie, the next highest in those two hands, and so on.

If, upon a call for a show of hands, it occurs that two or more parties interested in the call hold hands identical in value, and those hands are the best out, the parties thus tied must divide the pool, share and share alike.

THE TECHNICAL TERMS

Age.—Same as eldest hand.

Ante.—The stake deposited in the pool by the age at the beginning of the game.

Blaze.—This hand consists of five court cards, and, when it is played, beats two pairs.

Blind.—The ante deposited by the age previous to the deal. The blind may be doubled by the player to the left of the eldest hand, and the next player to the left may at his option straddle this bet; and so on, including the dealer, each player doubling. The player to the left of the age alone has the privilege of the first straddle, and if he decline to straddle, it debars any other player coming after him from doing so. To make a blind good costs double the amount of the ante, and to make a straddle good costs four times the amount of the blind. Each succeeding straddle costs double the preceding one.

Call.—When the bet goes round to the last bettor, a player who remains in, if he does not wish to see and go better,

simply sees and calls, and then all those playing show their hands, and the highest hand wins the pool.

CHIPS.—Ivory or bone tokens, representing a fixed value in money.

DISCARD.—To take from your hand the number of cards you intend to draw and place them on the table, near the next dealer, face downward.

DRAW.—After discarding one or more cards, to receive a corresponding number from the dealer.

ELDEST HAND, OR AGE.—The player immediately at the left of the dealer.

FILLING.—To match, or strengthen the cards to which you draw.

FOUL HAND.—A hand composed of more or less than five cards.

GOING BETTER.—When *any* player makes a bet, it is the privilege of the *next player to the left to raise him* — after making good the amount already bet by his adversary, to make a still higher bet.

GOING IN.—Making good the ante of the age and the straddles (if any) for the privilege of drawing cards and playing for the pool.

LIMIT.—A condition made at the beginning of a game, limiting the amount of any single bet or raise.

MAKING GOOD.—Depositing in the pool an amount equal to any bet previously made. This is done previous to raising or calling a player, and is sometimes called *seeing* a bet.

ORIGINAL HAND.—The first five cards dealt to any player.

PAT HAND.—An original hand not likely to be improved by drawing, such as a full, straight, flush, or pairs.

PASS.—*"I Pass,"* signifies that a player throws up his hand and retires from the game.

JACK POTS.—Comes from out West. See page 453.

RAISING A BET.—The same as *going better.*

SAY.—When it is the turn of any player to declare what he will do, whether he will *bet,* or *pass* his hand, it is said to be his *say.*

SEEING A BET.—Synonymous with *making good.*

STRADDLE.—Refer to *Blind.*

TABLE-STAKES. — A table-stake signifies that each player places his stake where it may be seen, and that a player can not be raised more than he has upon the table; but, at any time between deals, he may increase his stake from his pocket, or he may put up any article for convenience's sake, say a key, and state that that makes his stake as large as any other player's, and he is then liable to be raised to any amount equal to the stake of any other player, and must make good with cash. When playing table-stakes, if a player have no money on the table, he must put up or declare his stake previous to raising his hand, and, failing to do this, he must stand out of the game for that hand.

THE LAWS

CUT AND DEAL

(1.) The deal is determined by casting one card to each player, and the lowest card deals.

(2.) In casting for the deal, the ace is lowest and the king highest. Ties are determined by cutting.

(3.) The cards must be shuffled above the table; each player has a right to shuffle the cards, the dealer last.

(4.) The player to the right of the dealer must cut the cards.

(5.) The dealer must give each player one card at a time, in rotation, beginning to his left, and in this order he must deliver five cards to each player.

(6.) If the dealer deals without having the pack properly cut, or if a card is faced in the pack, there must be a fresh deal. The cards are reshuffled and recut, and the dealer deals again.

(7.) If a card be accidentally exposed by the dealer while in the act of dealing, the player to whom such card is dealt *must* accept it as though it had not been exposed.

(8.) If the dealer give to himself, or either of the other players, *more* or *less* than five cards, and the player receiving such a number of cards discover and announce the fact *before* he raises his hand, it is a misdeal.

(9.) If the dealer give to himself, or either of the other players, more or less than five cards, and the player receiving such improper number of cards *lift* his hand before he announces the fact, it is not a misdeal, and the player must retire from the game for that hand.

(10.) After the first hand the deal proceeds in rotation, beginning with the player to the left of the dealer.

DISCARD AND DRAW

(11.) After the deal has been completed, each player who remains in the game may discard from his hand as many cards as

he chooses, or his whole hand, and call upon the dealer to give him a like number from the top of those remaining in the pack. The eldest hand must discard first, and so in regular rotation round to the dealer, who discards last. All the players must have discarded before any party is helped.

(12.) Any player, after having asked for fresh cards, must take the exact number called for; and after cards have once been discarded they must not again be taken in hand.

(13.) Any player, previous to raising his hand or making a bet, may demand of the dealer how many cards he drew, and the latter must reply correctly. By raising his hand, or making a bet, the player forfeits the right to inquire, removing the obligation to answer.

(14.) Should the dealer give any player *more* cards than the latter has demanded, and the player discover and announce the fact before raising his cards, the dealer must withdraw the superfluous cards and restore them to the pack. But if the player raise the cards before informing the dealer of the mistake, he must retire from the game during that hand.

(15.) Should the dealer give any player fewer cards than the latter has discarded, and the player discover and announce the fact previous to lifting the cards, the dealer must give the player from the pack sufficient cards to make the whole number correspond with the number originally demanded. If the player raise the cards before making the demand for more, he must retire from the game during that hand.

(16.) If a player discard and draw fresh cards to his hand, and while serving him the dealer expose one or more of the cards, the dealer must place the exposed cards upon the bottom of the pack, and give to the player a corresponding number from the top of the pack.

BET, CALL, AND SHOW

(17.) In opening the pool, the age makes the first ante, which must not exceed one-half the limit. After the cards are dealt, every player in his proper turn, beginning with the player to the left of the age, must make this ante good by depositing double the amount in the pool, or retire from the game for that hand.

(18.) After the cards have been dealt, any player, in his proper turn, beginning with the player to the left of the age, after making good the age's ante, may raise the same any amount not exceeding the limit of the game.

(19.) After the hands are filled, any player who remains in the game may, in his proper turn, beginning with the player to the left of the age, bet or raise the pool any amount not exceeding the limit of the game.

(20.) After the draw has been made, the eldest hand or age has the privilege of deferring his say until after all the other players have made their bets, or passed. The age is the last player to declare whether he will play or pass. If, however, the age pass out of the game *before* the draw, then the next player to his left in the game after the draw must make the first bet; or, failing to bet, must pass out.

(21.) If a player, in his regular turn, bet, or raise a bet any amount not exceeding the limit of the game, his adversaries must either *call* him, *go better*, or retire from the game for that hand.

(22.) When a player makes a bet he must deposit the amount in the pool.

(23.) If a player makes good, or *sees* a bet, and calls for a show of hands, each player must show his entire hand to the board, the caller last, and the best poker hand wins the pool.

(24.) If a player bets, or raises a bet, and no other player *goes better* or *calls* him, he wins the pool and can not be compelled to show his hand.

(25.) Upon a show of hands, if a player miscall his hand, he does not lose the pool for that reason, for every hand shows for itself.

(26.) If a player pass or throw up his hand, he passes out of the game, and can not, *under any circumstances whatever*, participate further in that game.

(27.) Any player betting with more or less than five cards in his hand loses the pool, unless his opponents all throw up their hands before discovering the foul hand. If only one player is betting against the foul hand, that player is entitled to the ante and all the money bet; but if there are more than one betting against him, then the best hand among his opponents is entitled to the pool.

(28.) If a player makes a bet, and an adversary raises him, and the player who made the previous bet has not money sufficient to see the raise, he can put up all the funds he may have and call for a show for that amount.

(29.) None but the eldest hand (the age) has the privilege of *going a blind*. The

party next and to the left of the eldest hand may double the blind, and the next player straddle it, the next double the straddle, and so on, but the amount of the straddle, when made good, must not exceed the limit of the game.

(30.) A player can not straddle a blind and raise it at the same time, nor can any player raise a blind before the cards are dealt.

(31.) If the player to the left of the age decline to straddle a blind, he prevents any other player from doing so.

JACK-POT

This is played as follows: When all the players pass up to the blind hand, the latter allows his blind to remain in the pot, and each of the other players deposits a similar amount. The blind now deals, and any player in *his regular turn* may *open* or *break* the pot, provided he holds a pair of jacks or better, but a player is not compelled to do so, this being entirely optional.

Each player in turn, commencing with the one at the left of the dealer, declares whether he can and will open the pot.

If no player open the pot, then each player deposits in the pool the same amount that was previously contributed, and the deal passes to the next player. The same performance or mode of action will continue until some player holds the necessary cards, and is willing to break the pot.

A player may break the pot for any amount within the limits of the game, and each player in turn must make the bet good, raise it, or retire.

After all the players who determine to go in have made good the bet of the player who opened the jack-pot, and the hands have been filled, then the opener of the pot makes the first bet.

If all pass up to the player who broke the pot, the latter takes the pool, and can only be compelled to show the jacks, or better, necessary to break the pot.

A player who breaks the pot on a pair, may split the pair in order to draw to a four flush or straight; but, if he does so, he must lay the discard to one side, separate from any other cards, so that after the result has been determined he may satisfy the other players that he broke the pot with a correct hand. If this precaution is not observed, and attention is called to it, the delinquent is subject to deposit in the pool, as penalty, twice the amount of his original bet.

If no player come in except the one who broke the pot on an insufficient hand, a new hand must be dealt, and the penalty added to the pot.

STRAIGHT POKER

Straight poker, which is sometimes called Bluff, is played with a pack of fifty-two cards. The same rules as those of draw poker govern it. It differs from the latter game in the following particulars only:

(1.) The winner of the pool has the deal.

(2.) Each player antes before the cards are cut for the deal.

(3.) Any player may pass with the privilege of coming in again, provided no player *preceding* him has made a bet.

(4.) No player is permitted to discard or draw any cards.

(5.) When all the players pass, the eldest hand deals, and each player deposits another ante in the pool, thus making what is termed a "double-header." When a misdeal occurs, the rule is the same.

WHISKEY POKER

Each player contributes one chip to make a pool, and the same rules govern as at draw poker, save that the strongest hand you can get is a straight flush. Five cards are dealt to each player, one at a time, and an extra hand is dealt on the table, which is called the *widow.* The eldest hand then examines his cards, and if, in his judgment, his hand is sufficiently strong, he passes. The next player then has the privilege of the widow, and, supposing him to take it, he then lays his discarded hand (that which he relinquishes for the widow) face up in the centre of the table, and the next player to the left selects from it that card which suits him best in filling his hand, and so on all around the board, each player discarding one card and picking up another, until some one is satisfied, which he signifies by knocking upon the table. When this occurs, all the players around to the satisfied party have the privilege of one more draw, when the hands are shown, and the strongest wins. If any player knocks before the widow is taken, the widow is then turned face up, and each player from him who knocks has but one more draw. Should no one take the widow, but all pass to the dealer, he then turns the widow, and all parties have the right to draw until some one is satisfied.

THE POPULAR GAME OF BRIDGE

IN its funadamental principles, Bridge is the same as Single Dummy Whist, with several variations and additions.

The game is played by four persons, or two pairs of partners, as in whist.

The cards are shuffled, cut, and dealt precisely as in whist, except that the last card is not turned up for trump; the dealer having the right to name the trump suit, or announce "no trumps," if his hand seems sufficiently good to take over six tricks. This privilege may also be transferred to his partner if he wishes.

The eldest hand, or his partner, has the right to double; the dealer and his partner having then the right to "redouble," and so on, until satisfied. Each "double" operates to render the value of each trick-point twice as great as before.

After the eldest hand has led the first card, the dealer's partner spreads his hand, face upward, on the table, allowing the dealer to play both hands, as in Dummy Whist. Each trick is taken by the partners who capture it, and all trick-points over six are scored by the winning partners.

Thirty trick-points win the game. Two games out of three win the rubber. If the first two games are won by the same two partners, the third is not played. Trick-points alone win a game, and must always be considered apart from all other points in the game.

Trick-points differ in value according to the suit that is trump; their values being always multiplied by 2 in doubling, and by 2 again in redoubling. This is explained in Law 3.

In addition to these, there are various other points that count but do not score, as the product of the trick value of the suit by the number in each case. Thus, if a player and his partner hold four honors, when spades are trumps, it counts 8; when clubs are trumps, 16; when diamonds are trumps, 24; when hearts are trumps, 32, as explained in Law 2. Five honors score in similar fashion; while five honors in one hand score 20, 40, 60, or 80, according to the suit—being the product of the trick value of the suit by 10. Similarly, four honors in one hand score 16, 32, 48, or 64, according to the suit; five honors, one of which is in the partner's hand, score 18, 36, 54, or 72, according to the suit. Three honors between two partners, however, score 4, 8, 12, or 16, according to suit.

If the game is played without trumps, as already explained, each trick above six scores 12, but, since only the aces count as honors, the figures just given can not apply. However, three aces held by two partners count 30; four aces, 40, and four aces in one hand, 100.

Additional points may be counted for partners by what are known as *Slam* and *Chicane*, as explained in Laws 7 and 8. Also, when partners win a rubber, 100 points are counted in their favor, in addition to all other advantages gained by them.

THE LAWS OF BRIDGE

THE RUBBER

(1.) A rubber is the best of three games. A third game is not played in case the same partners have won the first two games.

SCORING

(2.) A game consists of not less than 30 trick-points obtained by tricks alone, exclusive of all other points that may be scored for Honors, Chicane, or Slam. Trick-points, and all the other points scored, are to be added together when the rubber is concluded.

(3.) Each trick above six counts 2 trick-points when spades are trumps; 4, when clubs are trumps; 6, when diamonds are trumps; 8, when hearts are trumps, and 12, when no trumps have been declared.

(4.) Honors consist of ace, king, queen, jack, and ten of the trump suit. When "no trump" has been declared, the trumps are only four of the aces.

The scores for honors are reckoned upon the original value of the trick-points. The value of honors is not affected by doubling or redoubling.

(5.) Honors in trumps are reckoned as follows: (*a*) If a player and his partner jointly hold five honors, they score for honors five times the original value of the trump-suit trick-points; (*b*) if a player and his partner hold four honors, they score for honors four times the original value of the trump-suit trick-points; (*c*) if they hold three honors, they score for honors twice the original value of the trump-suit

trick-points; (*d*) if a player holds in his own hand five honors of the trump suit, he and his partner score ten times the original value of the trump-suit trick-points.

If a player in his own hand holds four honors of the trump suit, he and his partner score eight times the value of the trump-suit trick-points. If the player's partner hold the fifth honor, they score in addition the single value of the trump-suit trick-points.

(6.) Honors, when no trump has been declared, are reckoned as follows: (*a*) If the player and his partner jointly hold four aces, they score for honors 40 points; (*b*) if they jointly hold three aces, they score 30 points; (*c*) if a player holds the four aces in his own hand, he and his partner score 100 points.

(7.) Chicane is when a player holds no trumps in his hand. When he and his partner score for the chicane, the original value of the trump-suit trick-points are unaltered by doubling or redoubling. If the partner of the player who has chicane has honors to score, the trick-points above named are added to his score for honors. If the opponents score honors, the trick-points are deducted from their score for honors.

(8.) Slam is when a player and his partner take all thirteen tricks; they score for Grand Slam 40 points.

(9.) If they take twelve tricks, they score for Little Slam 20 points.

(10.) At the conclusion of a rubber, 100 additional points are added to the score of the winning partners.

(11.) The total scores for trick-points, honors, and all other points gained by each side, are added together, and the differences between the total represents the number of points to be paid to the winning partners by the losing partners.

(12.) If an erroneous score affecting tricks should occur, such mistake can be rectified at any time prior to the conclusion of the round or play to a deal in which it occurs. A round is not concluded until the last card of the next following deal has been dealt, or until, in case of the last game of the rubber, the score has been finally made up.

(13.) If an erroneous score affecting honors, chicane, or slam should occur, the mistake may be corrected at any time before the score of the rubber has been finally made up.

(14.) Cutting-in, Cutting-out, Entry, Reentry, and Dealing are subject to the same laws as hold in Whist.

A NEW DEAL

(15.) There must be a new deal under all the following circumstances: (*a*) If, during a deal, or during the play of the hand, the pack be proved to be incorrect or imperfect; (*b*) if any card be faced in the pack; (*c*) if any player has more or less than thirteen cards; (*d*) a new deal is required under the same circumstances as hold in Whist.

The dealer does not lose the deal.

DECLARING TRUMPS

(16.) The dealer, having examined his hand, has the option of declaring what suit shall be trumps, or whether the hand shall be played without trumps. In the latter case, he declares, "No trumps."

(17.) If the dealer decline to take a declaration, he must pass it over to his partner by saying, "I leave it to you, partner," or words to that effect, and his partner must make such declaration as he may deem best.

(18.) A declaration once made can not be altered.

(19.) If the dealer's partner make a declaration before the dealer has ordered him to do so, either of the adversaries has the right, after looking at his hand, to demand a fresh deal, but is debarred from consulting his partner as to doing so.

DOUBLING AND REDOUBLING

(20.) Doubling, redoubling, etc.; doubles, quadruples, etc., the value of the trick-points as given in Law 3. The score for honors, slam, or chicane is in no wise affected by doubling, etc.

(21.) After the trump has been declared by the dealer or his partner, the opposing player on the dealer's left hand has the right to double. If he does not wish to double, he must say to his partner, "May I play?" If his partner does not wish to double, he answers "Yes"; otherwise he says, "I double."

(22.) If either of the opponents has doubled, the dealer or his partner may redouble, the declarer of the trump having the first right to do so.

(23.) If the dealer or his partner has redoubled, the opposing partners may redouble, the original doubler having the first right.

(24.) Redoubling may be repeated without limit, only ceasing when the question, "May I play?" has been answered "Yes." It is always advisable to establish a limit before commencing to play.

DUMMY

(25.) As soon as a card is led, the dealer's partner shall spread his cards, face upward, on the table, and the duty of playing cards from that hand, which is called Dummy, and of claiming and enforcing any penalties arising during the hand, shall devolve solely upon the dealer.

(26.) The dealer's partner, after exposing the dummy, is debarred from taking any part whatever in the play of the hand, excepting only that he may ask the dealer if he has a card of the suit which he may have renounced; and he may play a card from the dummy if ordered by the dealer.

(27.) If the dealer's partner should call attention to any incident in respect of which any penalty might be exacted, except as stated in Law 29, the fact that he has done so shall deprive the dealer of the right of exacting such penalty against adversaries.

(28.) When the dealer draws a card from dummy, or orders his partner to play a card, such card is not considered played until actually quitted.

(29.) As the dummy's cards are in plain view of his adversaries, he is not liable to any penalty for revoke. Should he revoke, and the error not be discovered until the trick is turned and quitted the trick stands good.

(30.) If the dealer lead out of turn, either from his own hand or from dummy, he incurs no penalty.

(31.) The holder of the dummy hand being barred from playing, his partner is not liable to any penalty for an error, which can give him no advantage. Thus he may expose some or all of his cards, or may declare that he has the game or trick, etc., without incurring any penalty.

EXPOSED CARDS

(32.) If after the deal has been completed and before the trump has been declared, either the dealer or his partner exposes a card from his hand, either of the adversaries, without consultation with his partner, may claim a new deal.

(33.) If after the deal has been completed and before a card is led, any player shall expose a card, his partner shall forfeit any right to double or redouble to which he would otherwise be entitled; and in case of a card being exposed by the leader's partner the dealer may, instead of calling the card, require the leader not to lead the suit of the exposed card.

CARDS LIABLE TO BE CALLED

(34.) All cards exposed by the dealer's adversaries are liable to be called, and must be left face upward upon the table; but a card is not an exposed card when dropped on the floor or elsewhere below the table.

THE REVOKE

(35.) A revoke is when a player (other than dummy) holding one or more cards of the suit led, plays a card of a different suit.

(36.) The penalty for a revoke, attaching to all players, except the dummy, is at the option of the adversaries. At the end of the hand they may, after consultation, either take three tricks from the revoking player and add them to their own, or deduct the value of three trick-points from his score, or add the value of three trick-points to their own score. No other methods can be adopted. The penalty (*a*) can be claimed for as many revokes as occur during the hand; (*b*) is applicable only to the score of the hand in which it occurs; (*c*) under no circumstances can the side revoking score game, grand slam, or little slam in that hand; (*d*) whatever their previous score may be, the side revoking can not attain a higher score toward the game than twenty-eight.

(37.) If a player discover his mistake in time to save a revoke, any player or players who have played after him may withdraw their cards and substitute others, and their cards withdrawn are not liable to be called. If, however, the revoking player be one of the dealer's adversaries, the dealer may call the card thus played in error, or may require him to play his highest or lowest card to that trick in which he had renounced.

(38.) If either of the dealer's adversaries prior to his partner playing should call attention to the trick either by saying that it is his or by naming his card, or drawing it toward him without being required to do so, the dealer may require that opponent's partner to play his highest or lowest card of the suit then led or to win or to lose the trick.

RULES AND REGULATIONS OF HEARTS

IN some respects the game of hearts is a variation of whist, with which it has several points in common. It is regularly played by four persons, each one being independent of every other, and never paired with a partner. The entire pack is dealt in rotation, as in whist, and the cards are played as in that game, each player being obliged to follow suit, if possible.

Unlike whist, however, tricks do not count for points, and the object of the game is to avoid taking tricks, particularly such as contain hearts. It is a matter of no importance, however, whether tricks are taken or not, so long as no hearts are captured.

The cards rank as in whist—the ace highest and the deuce lowest—although the ace is low in cutting. The deal is determined and performed precisely as in whist, but the last card is not turned for trumps, nor are trumps declared or used in play.

The play begins with the eldest hand, the first on the dealer's left, and continues, as in whist, the player taking the last trick leading in the next round. Each player strives to avoid taking a trick containing heart cards, also to get rid of all the hearts originally dealt to him.

At the close of the hand each player reports the number of hearts taken by him, retaining his captured tricks intact until the report is verified. He must then pay one chip into the pool for every heart taken. The pool is then divided among the players having taken no hearts, or, in case all the players hold hearts, the pool is divided among those holding only one heart each. In either case the odd chip goes to the winning player who is nearest to the dealer's left. The rules governing the division of the pool are as follows:

(1.) If one player takes the whole thirteen hearts, he must pay thirteen chips into the pool, which is thus divided: the other three players receive four chips each, and the odd chip goes to the winning player who sits nearest to the left of the dealer.

(2.) If only one player has captured no heart cards, he takes all the counters in the pool.

(3.) If two or more players have not captured heart cards, the pool is divided among them as equally as possible, any odd counters remaining after the division going to the winning player nearest to the left of the dealer.

(4.) When all the four players capture hearts, the player who takes the least number of hearts is paid by the other three.

A somewhat more satisfactory method is to make a pool to stand over for the next hand, if (1) all the players have taken hearts, or (2) one player has taken all the hearts. One player taking the entire heart suit pays 16 chips into the pool, but the rules of the game forbid the same player doing this twice in succession.

Another method, making the stakes somewhat higher, is to count 5 chips for the ace of hearts, 4 for the king, 3 for the queen, 2 for the jack, and 1 for every other heart card.

As regards dealing, revoking, etc., the same rules apply as in whist. If a card, belonging to a player other than the dealer, be exposed in dealing or a misdeal occur, the same dealer must deal again. A card exposed in the course of the play can not be called.

A revoke requires the player making it to pay into the pool chips to the number that it already contains and 13 in addition, and precludes him from winning any points in that round.

When a trick is won it must be gathered and turned before the next lead. Any player, however, may demand the right to look at the last trick turned.

Since the object of the game of hearts is to avoid taking a trick, particularly one containing heart cards, considerable care must be exercised in playing a hand. A few rules will suffice, however, to show the general principles involved:

(1.) It is well to play out a short suit as soon as possible.

(2.) It is well to play the highest cards of any suit held, as soon as opportunity presents, or whenever unable to follow the suit of the card led.

(3.) It is not advisable to lead from a short suit, unless all the cards be of low denomination.

(4.) In leading from a long suit, lead as low a card as possible, in order to avoid taking the trick, in case some other player is short that suit and discards a heart card.

(5.) In following a suit of which you hold

high cards, play a high card if the suit is long. It is better to take a trick without hearts than to be obliged to follow with a heart.

(6.) Lead from a single card of any suit except hearts.

(7.) Lead from the highest card of a short suit.

(8.) If you have two or three low hearts, with commanding cards in other suits, and no available short suit, lead a low heart whenever the opportunity presents, in order to eliminate this dangerous suit before some other player develops a short suit.

(9.) Do not lead the highest card of a suit that has already been led more than once, and in no case lead the last remaining card of a suit.

(10.) When a suit has been led three times, and one or two cards of other suits have been played to the leads, do not again lead the suit unless you are sure that you are leading the lowest card not played.

(11.) With a short suit (less than four) of the card led, play the highest, unless the suit led is hearts.

(12.) With a long suit of the card led, do not beat it, unless it is a very low one.

(13.) When holding no card of the suit led, discard your highest heart, unless you deem it more advisable to get rid of a dangerous card of another suit.

(14.) When hearts are led, play a low one, if possible lower than the card led. If compelled to take the trick, do so with your highest heart.

(15.) When you have commanding cards of the suit led the first time, being second or third player, play the highest you hold, taking the chances that no one is short of the suit in that round. Do not play the highest if it is your long suit; better underplay the highest card already played.

(16.) If possible, avoid taking a trick when you have no available card to lead.

FIVE OR SIX HANDED HEARTS

The game of hearts may be played by five or six players—sufficient small cards of any suit except hearts being rejected from the pack, in order to ensure the same number of cards being dealt to each player.

HEART JACK-POT

The jack-pot is kept entirely separate from the ordinary pool, and each player deposits a counter in a small dish provided for the purpose.

At every new deal, each player deposits one chip in the jack-pot, in regular rotation, until some player who has taken no trick at all in one round captures the jack-pot, together with all the chips he may be entitled to in the regular pool.

If only one player in the game takes no hearts, each of the others pays him a chip for each heart they have captured, as in the regular game, but the original four chips must remain in the pot.

If two or more players take no hearts, twelve chips are equally divided between them, but the thirteenth chip must be put into the jack-pot, thus increasing its value.

If all the players capture hearts, the thirteen chips do not go into the jack-pot, but form a double pool, and the whole is divided equally between the players who capture no hearts in the next round.

If three players take no hearts, then the odd chip remaining after the division has been made goes into the jack-pot.

If it should happen that two players take no trick, then the jack-pot is divided, any odd counter remaining after the equal division being left for the new jack-pot.

GAMES OF SKILL

FOREMOST among the games under this head may be mentioned Chess, Draughts or Checkers, and Dominoes. Each of them demands study and practice, in order to be really enjoyable, and, when proper rules are observed, the element of chance is reduced to the lowest terms.

Chess is one of the most ancient of known games of skill. Various theories are advanced as to its origin. One account states that the wife of Ravanna, King of Ceylon, devised it in order to amuse her royal spouse with an image of war while his metropolis was closely besieged by Rama. This tradition would place the origin of the game at about 3000 B.C., according to the estimates of conservative historians. There is little certainty, however, beyond the fact that it was anciently known in India, whence it was carried to China, Japan, Persia, and Arabia. It appeared in Europe in early mediæval times, where it was the "favorite amusement of both court and cloister." Originally it was played by four persons, being known as *Chaturanga,* which is the Sanskrit word for "four-hand." Later in its history the rules were modified to accommodate only two players, as at present. The European game, as at present played among us, represents still further modifications of the Oriental rules. Since multitudes of volumes have been written on the game and the situations involved in playing it, no more can be attempted here than to give an outline of the rules.

Draughts or Checkers is another ancient game, most probably of Egyptian origin. Ancient sculptors represent the Pharaohs playing the game with their wives and courtiers. From their day to the present it has been popular in the Land of the Nile, whence it was imported to Europe a few centuries ago.

As a game, it is very often underrated, because it is supposed that there is little or no play in it. Thus, when a person is asked if he plays draughts, his reply is not unusually, "No, it is such a stupid game."

Whenever this remark is made to us, we challenge the person to a series of games, when, having beaten him some half-dozen in succession, we prove that there must be some play in the game, or such a result would be improbable.

When playing chess, there are so many pieces, each having a different moving power and a relative value, that one oversight, caused probably by a momentary relaxation of memory, loses a game, whereas in draughts such a result is less probable, and the attention can be more completely

devoted to some plot, through which the opponent does not see. As a rule, a good draught-player is a more acute person on every-day subjects than is a good chess-player, and thus we strongly recommend draughts as a game likely to call into action very useful qualities.

Another ancient game is that known as Dominoes, which has been attributed by various authorities to the Greeks, Hebrews, and Chinese. It was introduced into Italy several centuries ago, whence, about the middle of the eighteenth century, it was taken to France. In the latter country it is still popular in the *cafés* and public resorts, being very nearly a characteristic national game. Quite contrary to the supposition that it is a trivial amusement, those best acquainted with the game agree that it affords room for much curious calculation. It is by no means a mere game of chance. Let any ordinary player enter the lists against an old and experienced hand, and he will soon discover that it requires something besides good weapons to come off victorious in this as in most other contests. In fact, it is as much a game of skill as any of the card games. A moderately good player can generally tell what his adversary has in his hand, by his style of play; and by calculating two or three moves in advance, he may either block the game or leave it open, just as he finds it will suit his purpose.

The ordinary game—technically termed "double sixes"—is played with twenty-eight dominoes. In some parts of England—chiefly in the North—they use "double nines" and "double twelves." But it signifies little how many dominoes are used, the rules and principles of the game, as here laid down, will, in most cases, equally apply.

GENERAL RULES FOR THE GAME OF CHESS

WE will now proceed to give the necessary directions for playing the game. The game is played on a board divided into sixty-four squares, colored alternately black and white. It is the same as that used at draughts. Eight pieces of different denominations and powers, and eight pawns, are allotted to each competitor. As a necessary distinction, each set is colored in a different way, one commonly being white, the other red or black. The pieces are named as follows:



Every player, therefore, is provided with one king, one queen, two bishops, two knights, and two rooks, besides the eight pawns. They are placed, at the beginning of each game, in the order shown on the facing page.

In placing the board, care must be taken that a white corner square be at the right hand of each player. It should also be observed that the queen must be placed upon a square of her own color.

THE PIECES: THEIR POWERS AND MODE OF ACTION

The king can move in any direction—forward, backward, sidewise, or diagonally—provided always, of course, that he does not move into check. The king possesses one great prerogative—that of *never being taken;* but, by way of counterbalancing the advantage of this exemption, he is restrained from exposing himself to *check.* He can move only one square at a time, except when he *castles,* which he may do once dur-

ing each game. He may then move two squares. He can not *castle* when in *check*, nor after he has once moved, nor with a rook that has been moved, nor if any of the squares over which he has to move be commanded by an adverse piece.

The queen can move either horizontally or diagonally. She combines the powers of the bishop and the rook. She can, at one move, pass along the whole length of the board, or, if moving diagonally, from corner to corner. Although she can move and take in the same manner as a bishop or as a rook, she must make the whole of one move in one direction, and can not combine *in one move* the powers of these two pieces: in other words, she can not move round a corner at one step.

The rook (sometimes called the castle) may pass along the entire length of the



board at one move. It may move backward, or forward, or sidewise—but always horizontally, never diagonally.

The bishop can move only in a diagonal direction, but can go any number of squares, from one to eight, or as far as the space be open. The bishop can never change the color of his square. Thus, the white king's bishop being on a white square at the beginning, remains so throughout the game. This is a necessary consequence of his move being purely diagonal.

The knight has a power of moving which is quite peculiar, and rather difficult to explain. He moves two squares at once in a direction partly diagonal and partly straight. He changes the color of his squares at every move. The knight is the only piece that possesses what is styled the "vaulting motion." He is not precluded from going to a square between which and his own other pieces intervene. Thus, instead of moving your king's pawn two, as your first move, you might, if good play permitted it, move out either of your knights right over the row of pawns in front. This power is possessed by the knight alone, all the other pieces being obliged to wait until there is an opening in front of them before they can emerge.

The pawn moves in a straight line toward the adverse party. It can not move out of its file except in capturing one of the opposing pawns or pieces, when it steps one square in a diagonal or slanting direction, and occupies the square of the captured piece. It can only be moved one square at a time, excepting in the first move, when the player has the option of advancing it two squares. The pawn is the only piece which can not retreat, and which does not take in the direction in which it moves. For full explanations relative to "queening the pawn," and taking a pawn *en passant*, see instructions on those points.

ABBREVIATIONS

The abbreviations which are invariably used in chess publications are the following: K. for king, Q. for queen, B. for bishop, Kt. for knight, R. for rook, P. for pawn, Sq. for square, and Ch. for check. The pieces on one side of the board are distinguished from those on the other in the following manner: Those on the same side as the king are named after him, as K.'s B. (king's bishop), K.'s Kt. (king's knight), K.'s R. (king's rook); while those on the same side as the queen are named Q.'s B. (queen's bishop), Q.'s Kt. (queen's knight), Q.'s R. (queen's rook). The pawns are distinguished in like manner. The pawn occupying the square in front of the K.'s B. is called K.'s B.'s P.; that in front of the K.'s Kt. is called K.'s Kt.'s P.; that in front of the Q.'s R. the Q.'s R.'s P., etc.

CHESS NOTATION

It is very necessary that the beginner should thoroughly understand the system of notation which is used, for without it he could never make any use of book games.

The diagram on next page fully explains it. It will be seen that the moves are reckoned both for black and white.

Suppose the white queen's bishop moves one square, it is then said to stand on its second, which is the black queen's bishop's seventh. The white king's eighth is the black king's first, and *vice versâ* all through the pieces.

TECHNICAL TERMS USED IN THE GAME

The Move.—Whichever player opens the game by making the first move is said to have "the move."

Check.—When your king is attacked by any piece, he is said to be "in check," and it is your opponent's duty to give you warning of such an event by crying "Check," when he makes the move. You must then put your king out of check by moving him, by taking the checking piece, or by interposing one of your own men between the checking piece and your king, thus "covering" check, as it is termed.

Checkmate is the term used when the king is in inextricable check, *i.e.*, when none of

Black.

Q.R.8.	Q.Kt.8.	Q.B.8.	Q.8.	K.8.	K.B.8.	K.Kt.8.	K.R.8.
Q.R.7.	Q.Kt.7.	Q.B.7.	Q.7.	K.7.	K.B.7.	K.Kt.7.	K.R.7.
Q.R.6.	Q.Kt.6.	Q.B.6.	Q.6.	K.6.	K.B.6.	K.Kt.6.	K.R.6.
Q.R.5.	Q.Kt.5.	Q.B.5.	Q.5.	K.5.	K.B.5.	K.Kt.5.	K.R.5.
Q.R.4.	Q.Kt.4.	Q.B.4.	Q.4.	K.4.	K.B.4.	K.Kt.4.	K.R.4.
Q.R.3.	Q.Kt.3.	Q.B.3.	Q.3.	K.3.	K.B.3.	K.Kt.3.	K.R.3.
Q.R.2.	Q.Kt.2.	Q.B.2.	Q.2.	K.2.	K.B.2.	K.Kt.2.	K.R.2.
Q.R.sq.	Q.Kt.sq.	Q.B.sq.	Q.sq.	K.sq.	K.B.sq.	K.Kt.sq.	K.R.sq.

White.

CHESS NOTATION FROM EACH END OF THE BOARD.

the above means avails to place him beyond the range of the attacking pieces. When a checkmate is obtained, the game is at an end, that being the sole object.

Discovered Check is when the player moves a pawn or piece from before another piece, thereby opening or "discovering" check; *e.g.*, the black rook may be on a line with the opposing king, the only intervening piece being a black pawn. The removal of this pawn is said to "discover check."

Double Check is when check is discovered as above, the king being also attacked by the piece moved.

Perpetual Check is when the king of one of the players can be checked almost at every move, and when he has little else to do but move out of check. When the game has reached this stage, the weaker player may demand that checkmate shall be given in a certain number of moves, in default of which it may be declared a drawn game. (See Law 13.)

Drawn Game.—A drawn game may arise from several causes:

1. As above.

2. Stalemate. (See "Stalemate.")

3. Equal play. "Between very good players," remarks Phillidor, "it sometimes happens that the equipoise in force and position is constantly sustained in the opening, in the intermediate stages, and in the last result; when either all the exchangeable pieces have been mutually taken, or the remaining forces are equal—as a queen against a queen, a rook against a rook, with no advantage in position, or the pawns are mutually blocked up."

4. Absence of mating power, *i.e.*, when neither player possesses the force requisite to obtain a checkmate. ("See "Mating Power.")

5. Unskilful use of a sufficiently strong force. If one player is superior in force to his adversary, and possesses the requisite mating power, the game may still be drawn by the unskilful use of that superiority. If he can not effect a checkmate in fifty moves it may be declared a drawn game.

Stalemate describes that state of the game when one of the players has nothing left but his king, which is so placed that, although not in check, he can not move without going into check.

Castling is a double operation, accomplished by moving the king and one of the rooks at the same time. When the removal of the bishop and the knight on the one side, or of the bishop, knight, and queen on the other, has cleared the intervening squares, the king may *castle* with either of his rooks. If it should be done on the king's side of the board, the king is to be placed on the knight's square, and the rook on the bishop's; if in the queen's section, the king must be moved to the bishop's square, and the rook to the queen's. In other words, the king, in either case, must move two squares, and the rook be placed on the opposite side of him to that on which he stood before.

En Prise.—A piece is said to be *en prise* when under attack.

En Passant (*in passing*).—If your adversary has advanced one of his pawns to the fifth square, and you move one of your pawns in either of the adjoining files two squares, he is entitled to take your pawn, *en passant*, as though you had only moved it one square. This peculiar mode of capture can only be effected by pawns.

Ranks and Files.—The lines of squares running from left to right are known as

ranks, and those perpendicular to them, running from one player to the other, are called *files*.

Passed and Isolated Pawns.—A pawn is said to be "passed" when it is so far advanced that no pawn of the adversary's can oppose it. An isolated pawn is one that stands alone and unsupported.

Double Pawn.—Two pawns on the same file.

"J'adoube" (signifying *I adjust* or *I arrange*) is the expression generally used when a player touches a piece to arrange it without the intention of making a move. Perhaps it is not absolutely necessary that he should say *"J'adoube,"* but he must at any rate use an equivalent expression.

To Interpose.—This term explains itself. If your king or one of your pieces is attacked, and you move another of your pieces between the attacking piece and the piece attacked, either for the purpose of covering check, or as a means of protection, or with any other object, you are said to "interpose."

Winning the Exchange.—You are said "to win the exchange" when you gain a rook for a bishop, a bishop for a knight, or, in short, whenever you gain a superior piece by giving an inferior.

Queening a Pawn.—You are said to "queen a pawn" when you advance it to the eighth square on the file. You may then claim a queen or any other piece in exchange for it. Formerly the rule was, that you might substitute for it any piece you had previously lost, but according to the modern game three or more rooks, or bishops, or knights may be obtained in this way.

Gambit.—This term, which is derived from the Italian, describes an opening in which a pawn is purposely sacrificed at an early stage of the game, in order subsequently to gain an advantage. Several gambits are distinguished by the names of their inventors, such as the Cochrane gambit, the Muzio gambit, the Salvio gambit, etc.; there are also the bishop's gambit, the queen's gambit, etc.

Mating Power.—Force requisite to bring about a checkmate: a king and queen against king and two bishops, king and two knights, king and bishop and knight, or against king and rook, can effect checkmate. King and two bishops can mate against king and bishop, or king and knight. King with two bishops and knight can mate against king and rook. King with rook and bishop can mate against rook and king. King can always draw against king and bishop, or king and knight. King and rook against either a king and bishop, or king and knight, makes a drawn game, etc.

LAWS OF THE GAME

The following laws are in force in all the principal clubs in this country:

1. If a player touch one of his men, unless for the purpose of adjusting it, when he must say *"J'adoube"* (see Law 4), or it being his turn to move, he must move the piece he has so touched.

[Walker gives the following remarks on this law: "When you touch a piece with the *bona fide* intention of playing it, the saying *J'adoube* will not exonerate you from completing the move. A chess-player's meaning can not be misunderstood on the point; and were it otherwise, you might hold a man in your hand for five minutes, and then saying *'J'adoube,'* replace it, and move elsewhere."]

2. If the men are not placed properly at the beginning of the game, and this is discovered before four moves have been made on each side, the game must be recommenced. If the mistake should not be found out till after four moves have been made, the game must be proceeded with.

3. Where the players are even, they must draw lots for the first move, after which they take the first move alternately. When a player gives odds, he has the option of making the first move, and the choice of men in every game.

[In giving odds, should it be agreed upon to give a pawn, it is customary to take the K. B. P. If a piece is to be given, it may be taken from either the king's or queen's side.]

4. If a player should accidentally or otherwise move or touch one of his men without saying *"J'adoube,"* his adversary may compel him to move either the man he has touched or his king, provided the latter is not in check.

5. When a player gives check, and fails to give notice by crying "Check," his adversary need not, unless he think proper, place his king out of check, nor cover.

[If it is discovered that the king is in check, and has been so for several moves past, the players must move the men back to the point at which they stood when check was given. If they can not agree as to when check was first given, the player who is in check must retract his last move, and defend his king.]

6. The player who effects checkmate wins the game.

7. Stalemate constitutes a drawn game.

8. So long as you retain your hold of a piece you may move it where you will.

9. Should you move one of your adversary's men instead of your own, he may compel you to take the piece you have touched, should it be *en prise*, or to replace it and move your king; provided, of course, that you can do so without placing him in check.

10. Should you capture a man with one that can not legally take it, your adversary may compel you either to take such piece (should it be *en prise*) with one that *can* legally take it, or to move the piece touched; provided that by so doing you do not discover check, in which case you may be directed to move your king.

11. Should you move out of your turn, your adversary may compel you either to retract the move, or leave the piece where you placed it, as he may think most advantageous.

12. If you touch the king and rook, intending to castle, and have quitted hold of the one piece, you must complete the act of castling. If you retain your hold of both, your adversary may compel you to move either of them.

13. The game must be declared to be drawn should you fail to give checkmate in fifty moves, when you have

King and queen against king.
King and rook against king.
King and two bishops against king.
King, bishop, and knight against king.
King and pawn against king.
King and two pawns against king.
King and minor piece against king.

14. Drawn games of every description count for nothing.

15. Neither player may leave a game unfinished, nor leave the room without the permission of his adversary.

16. Lookers-on are not permitted to speak, nor in any way express their approbation or disapprobation while a game is pending.

17. In case a dispute should arise on any point not provided for by the laws, a third party must be appealed to, and his decision shall be final.

HINTS FOR COMMENCING THE GAME

To open the game well, some of the pawns should be played out first. The royal pawns, particularly, should be advanced to their fourth square; it is not often safe to advance them further. The bishop's pawn should also be played out early in the game; but it is not always well to advance the rook's and knight's pawns too hastily, as these afford an excellent protection to your king in case you should castle. Phillidor describes pawn-playing as "the soul of chess." When they are not too far advanced, and are so placed as to be mutually supporting, they present a strong barrier to the advance of your adversary, and prevent him from taking up a commanding position. If you play your pieces out too early, and advance too far, your adversary may oblige you to bring them back again by advancing his pawns upon them, and you thus lose time.

Do not commence your attack until you are well prepared. A weak attack often results in disaster. If your attack is likely to prove successful, do not be diverted from it by any bait which your adversary may purposely put in your way. Pause, lest you fall into a snare.

Beware of giving check uselessly—*i.e.*, unless you have in view the obtaining of some advantage. A useless check is a move lost, which may, particularly between good players, decide the game.

It is generally injudicious to make an exchange when your position is good, or when, by so doing, you bring one of your adversary's pieces into good play. Never make an exchange without considering the consequences. When your game is crowded and ill arranged and your position inferior, it is advantageous to exchange. Sometimes also, when you are much superior in force, it is worth your while to make an equal exchange.

The operation of castling often relieves a crowded game. A lost opportunity of castling, or castling at the wrong time, is a disadvantage which may be turned to account by your adversary.

Never put your queen before your king in such a way that your adversary may bring forward a bishop or rook and attack her, and the king through her. In such a case, unless you can interpose another piece, you will inevitably lose your queen.

It is good play to "double" your rooks—*i. e.*, to make them mutually supporting. Don't bring your rooks into active play too soon. They can generally operate most effectively at a distance, and they are therefore of most value toward the end of a game, when the board is comparatively clear.

From time to time take a review of the game. Although an incurably tedious player is a general nuisance, it is mere folly to play without "knowing the reason why." To take an occasional review of the game gets you into a systematic habit. When near the close, take notice of the position of your adversary's pawns, and if you find that you can queen before him, make all haste to do so;

if not, attack his pawns so as to prevent him from queening. If your adversary possesses a decided advantage, look out for a means of drawing the game.

Do not stick to one opening, but learn as many as you can.

Always be willing to accept odds of a better player, so that the game may be interesting to him. If you should lose, it is natural that you should feel inwardly chagrined, but do not let your disappointment be perceived. "Keep your temper" is a golden rule. Do not give up the game before you are quite sure it is lost. On the other hand, you should not too hastily jump to the conclusion that you have won it.

It is necessary that you should occasionally study some of the best book games, but without actual practice proficiency can seldom be attained.

Endeavor to understand the reasons which lead to your adversary's moves, and take measures accordingly.

"Openings" of Games.—The principal openings are the king's gambit, the queen's gambit, the king's knight's opening, the king's bishop's opening, etc. From these spring the various gambits, known as the Evans, the Muzio, the Cunningham, the Allgaier, the Cochrane, the Giuoco piano, etc., most of them deriving their names from the inventors. All these gambits have a variety of subdivisions, and openings not founded on them are termed irregular openings. We shall, after defining each of the most celebrated of these openings, give illustrations of them.

The King's Gambit.—In this gambit, the first player advances his K. B. P. two squares at his second move.

The Queen's Gambit is when the first player, at his second move, advances his Q. B. P. two squares.

King's Bishop's Gambit is so styled because the first player brings out the K. B. at his second move.

King's Knight's Gambit.—In this much-used opening the first player brings out his K. Kt. at his second move.

The Evans Gambit, so styled from its inventor, Captain W. D. Evans, R. N., is when the player advances Q. Kt. P. two at his fourth move, and sacrifices it, with the object of recovering at least its equivalent, at the same time obtaining a decided lead.

Besides the above, there are the queen's pawn-two-opening, the queen's bishop's pawn's opening, the Lopez gambit, the king's pawn-one-opening, the queen's counter-gambit, the king's rook's pawn's gambit, the Allgaier gambit, the Muzio gambit, the Cochrane gambit, the Cunningham gambit, the bishop's gambit, the Damian's gambit, the Greco counter-gambit, etc., etc.

In an article of such limited scope as the present, it would be impossible to treat at any length upon every one of these openings. We shall therefore content ourselves with making a selection which will be at once interesting and suitable for beginners. In every case we have preferred to give those variations which are considered the *best* and *most legitimate,* believing that the study and practice of such positions will be more advantageous to the learner than giving, as some writers do, inferior play and positions, and then afterward giving the correct ones.

The King's Gambit.—

White.	Black.
1. K. P. 2.	1. K. P. 2.
2. K. B. P. 2.	2. P. takes P.
3. K. Kt. to B. 3.	3. K. Kt. P. 2.
4. K. B. to Q. B. 4.	

There has been much difference of opinion as to the move which black should now make. Some writers prefer advancing K. Kt. P., while Walker and a whole host of authorities think it better to place the K. B. at Kt. second: "Although," says Walker, "playing the pawn is productive of more brilliant situations." He advises both moves for practice.

King's Bishop's Opening.—This opening is considered by the great chess master, Phillidor, as the very finest opening for the first player, as it brings out the bishop at the second move, and immediately attacks black's K. B. P., his weakest point. From this opening spring some of the finest and most difficult combinations known. It commences thus:

White.	Black.
1. K. P. to K. 4.	1. P. to K. 4.
2. K. B. to Q. B. 4.	2. K. B. to Q. B. 4 (best).
3. P. to Q. B. 3.	3. Q. to K. 2 (good).
4. K. Kt. to B. 3.	

Some prefer to play the Kt. to K. 2, but in our opinion this is not so good as to B. 3, because in the former case black could take K. B. P. with his bishop (check); and if white K. takes bishop, black queen gives check at her B. 4, and white loses bishop.

White.	Black.
	4. K. Kt. to B. 3.
5. Q. to K. 2.	5. P. to Q. 3.
6. P. to Q. 3.	6. P. to Q. B. 3.

If black plays his Q. B., pinning Kt., white will advance R. P., which will cause black either to retire bishop (which will be losing time) or force an exchange, which will open the game to white's queen. Therefore it will be better for black to play P. to Q. B. 3, as we have given it, which will leave the game pretty equal up to this point. If

black, at his third move, replies as follows —which is an inferior move—then the game proceeds thus:

White.	Black.
	3. K. Kt. to B. 3.
4. P. to Q. 4.	4. P. takes P.
5. P. to K. 5.	5. Kt. to K. 5.
6. Q. to K. 2.	6. Kt. to Kt. 4.
7. P. to K. B. 4.	7. Kt. to K. 3.
8. P. to K. B. 5.	
If black now play	8. Kt. to K. B.,

white has the best of the game, and ought to win; but if black play Kt. to Kt. 4, white will play Q. to K. R. 5, and then P. to K. R. 4. If white at his third move should play Q. to K. 2, attacking K. B. P. and threatening ch. with Q. and capture of bishop, and if black advance Q. P. one, it may then become the Ruy Lopez gambit by white playing as his fourth move P. to K. B. 4. If the gambit referred to be not properly met, it leads to strong positions of attack. It is better for the second player to refuse the pawn offered.

King's Knight's Opening.—This is a sound opening, and has been largely treated upon by many writers. Some fine situations spring from it. At the second move, white directly attacks K. P. with K. Kt. We will give the opening, and a few brief remarks thereon, together with a game arising from it:

White.	Black.
1. P. to K. 4.	1. P. to K. 4.
2. K. Kt. to B. 3.	

For black, in reply to this, to move P. to K. B. 3, would only show weak play, and would enable white to win in a few moves, or at any rate to obtain a rook and a pawn in exchange for a knight. Black's best answer is the following:

2. Q. Kt. to B. 3.

Black thus defends his pawn, and has the advantage of a counter-attack.

King's Knight's Gambit.—This is a variation of the king's gambit, brought about by white at his fourth move advancing the K. R. P. before bringing out his K. B. This variation brings out some fine play, but is not so strong for the first player as the king's gambit proper. The Allgaier gambit springs from this opening.

White.	Black.
1. P. to K. 4.	1. P. to K. 4.
2. P. to K. B. 4.	2. P. takes P.
3. K. Kt. to B. 3.	3. P. to K. Kt. 4.
4. P. to K. R. 4.	4. P. to K. Kt. 5 (best).
5. K. Kt. to K. 5.	

By white's last move the game emerges into the Allgaier. Black's best move now is

	5. P. to K. R. 4.
6. K. B. to Q. B. 4.	6. R. to K. 2.

This move of black's is considered better than K. Kt. to R. 3.

7. P. to Q. 4.	7. P. to Q. 3.
8. Kt. to Q. 3.	8. K. B. P. advances.

If white now plays K. Kt. P., black has the best of the game by keeping the gambit pawn. If white attacks queen with bishop, black will give check with pawn, and have the stronger game. Most authorities consider this opening weak for the first player.

The Allgaier Gambit.—This opening, the invention of a noted German from whom it takes its name, arises out of the king's knight's gambit, as detailed in the preceding paragraph. It is not a safe opening, although, if successful, it will prove a strong one. When properly met, the siege is soon raised, and the second player will stand in the better position. It is, however, a fine opening, and requires cautious play on both sides. It is as follows:

White.	Black.
1. P. to K. 4.	1. P. to K. 4.
2. P. to K. B. 4.	2. P. takes P.
3. K. Kt. to B. 3	3. P. to K. Kt. 4.
4. P. to K. R. 4.	4. P. to K. Kt. 5.
5. K. Kt. to Kt. 5.	

White's fifth move constitutes the Allgaier gambit, white intending to sacrifice the knight if attacked by the pawns. Black may reply in several ways, but in our opinion his best move is the following:

	5. P. to K. R. 3.
Black by this move wins the knight.	
6. Kt. takes K. B. P.	6. K. takes Kt.
7. Q. takes P.	7. K. Kt. to B. 3.
8. Q. takes B. P.	

The last move is much better than giving check with the bishop, which would only have the effect of involving white's game. Walker says, "No better move can be played at this crisis." It will be good practice for the student to continue the above opening, and exercise his ingenuity by finishing the game.

The Muzio Gambit.—This is another variation of the king's gambit, and is produced by white offering to sacrifice knight in order to gain a strong attacking position. It is the invention of Signor Muzio, an Italian player of some eminence. Walker says this may be classed as the most brilliant and critical opening known, and recommends the student to play it at every opportunity; he also throws out the warning that an incorrect move may irrecoverably lose the game. The defence is most difficult to discover in actual play.

White.	Black.
1. P. to K. 4.	1. P. to K. 4.
2. P. to K. B. 4.	2. P. takes P.
3. K. Kt. to B. 3.	3. P. to K. Kt. 4.
4. K. B. to Q. B. 4.	4. K. Kt. P. advances.
5. Castles.	

This move constitutes the gambit; for, instead of white withdrawing his Kt., or moving it to Q. 4, he allows it to remain and be

taken. It now rests with black whether he will accept the gambit. Walker says he can not do better.

	5. P. takes Kt.
6. Q. takes P.	6. Q. to K. B. 3 (best).

This last move is Sarratt's defence, which is clearly shown to be the best.

7. K. P. advances.	7. Q. takes K. P.

This is black's best move, for, if he does not take P., white at once obtains the advantage by playing P. to Q. 2, defending K. P. If black play Q. to Kt. 3 (ch.), white moves K. to R. sq., and ought to win.

The Scotch Gambit, or *Queen's Pawn Two Opening*.—This gambit has a fine, dashing attack, and one of its advantages is, that in case it should miscarry, the disaster is comparatively slight. "It is," as Walker says, "one of the most attacking yet safe methods of commencing the game which can possibly be adopted." Again, "It is alike fertile in resource and safe in results."

White.	Black.
1. P. to K. 4.	1. P. to K. 4.
2. K. Kt. to B. 3.	2. Q. Kt. to B. 3.
3. P. to Q. 4.	

The third move of white gives it the name of the Queen's Pawn Two Opening. White plays the pawn for the purpose of opening the game, especially for his bishops. Black may now take the pawn either with his P. or Kt. We will suppose him to do the former, which we consider best:

	3. P. takes P.
4. K. B. to Q. B. 4.	

Some players now give black's fourth move as B. to Q. Kt. 5 (ch.); but this is a decidedly bad move, and with an indifferent player would lose the game. Black's best move is that introduced by Macdonnell, and described by Walker as a sound defence. We give it below:

	4. Q. to K. B. 3.

White may now castle, or play P. to Q. B. 3; either of which is better than Kt. or B. to K. Kt. 5.

HOW TO FINISH THE GAME

Having now considered the "Hints for Commencing the Game," and studied most of the principal openings, we must say a few words with regard to finishing the game. It is often very difficult to checkmate when you have a king, bishop, and knight against a king. Although possessing the requisite mating power, good players have often failed to accomplish the mate within the stipulated fifty moves. The only way in which it can be done is by driving the adverse king to a corner commanded by your bishop. The better to convey our meaning, we give an illustration. Suppose the men to be placed thus:

White K. at K. B. 6.
" K. B. at K. B. 5.
" Kt. at K. Kt. 5.
Black K. at K. R. sq.

Then, in eighteen moves, white may effect checkmate:

White.	Black.
1. Kt. to K. B. 7 (ch.).	1. K. to Kt. sq.
2. B. to K. 4.	2. K. to K. B. sq.
3. B. to K. R. 7.	3. K. to K. sq.
4. Kt. to K. 5.	4. K. to K. B. sq.
5. Kt. to Q. 2.	5. K. to K. sq.
6. K. to K. sq.	6. K. to Q. sq.
7. K. to Q. 6.	7. K. to K. sq.
8. B. to K. Kt. 6 (ch.).	8. K. to Q. sq.
9. Kt. to Q. B. 5.	9. K. to Q. B. sq.
10. B. to B. 7.	10. K. to Q. sq.
11. Kt. to Q. Kt. 7 (ch.).	11. K. to Q. B. sq.
12. K. to Q. B. 6.	12. K. to Q. Kt. sq.
13. K. to Q. Kt. 6.	13. K. to Q. B. sq.
14. B. to K. 6 (ch.).	14. K. to Q. Kt. sq.
15. Kt. to Q. B. 5.	15. K. to Q. R. sq.
16. B. to Q. 7.	16. K. to Q. Kt. sq.
17. Kt. to Q. R. 6 (ch.).	17. K. to Q. R. sq.
18. B. to Q. B. 6, checkm.	

As will be observed from the above example, one of the important objects is never to let the king escape into the middle of the board.

In our division on checkmate we should not omit to give the "Fool's Mate" and the "Scholar's Mate."

The former shows that it is possible to effect mate in as few as two moves. It is easy to understand why it should be named the "fool's mate"; but why a checkmate which may be effected in four moves should be termed "scholar's mate" is probably less capable of explanation.

Fool's Mate.—

White.	Black.
1. K. Kt. P. 2 sq.	1. K. P. 2.
2. K. B. P. 1 sq.	2. Queen mates.

Scholar's Mate.—

White.	Black.
1. K. P. 2.	1. K. P. 2.
2. K. B. to Q. B. 4.	2. K. B. to Q. B. 4.
3. Q. to K. R. 5.	3. Q. P. 1.
4. Q. takes K. B. P., giving "scholar's mate."	

King and Queen against King.—Several examples of this checkmate might be given, but the one below will probably be sufficient. The principal point upon which the learner need be warned is against allowing his adversary to effect stalemate. Suppose the pieces to be placed thus:

White king at K. sq.
" queen at Q. B. sq.
Black king at Q. 3.

The game may then proceed as follows:

White.	Black.
1. Q. to K. Kt. 5.	1. K. to K. 4.
2. K. to K. 2.	2. K. to Q. 3.
3. K. to K. 3.	3. K. to K. 3.
4. K. to K. 4.	4. K. to Q. 3.
5. Q. to K. Kt. 6.	5.
6. K. advances.	6.
7. Q. mates.	

King and Queen against King and Rook.—Suppose the men to be placed thus:

White king at K. B. 3.
" queen at K. sq.
Black king at K. R. 7.
" rook, at K. Kt. 7,

supposing white to have the first move, the game may be completed in three moves:

White.	Black.
1. Q. to K. 5 (ch.).	1. K. to R. 8.
2. Q. to Q. R. (ch.).	2. K. moves.
3. Q. to K. sq., and wins.	

RULES FOR PLAYING DRAUGHTS OR CHECKERS

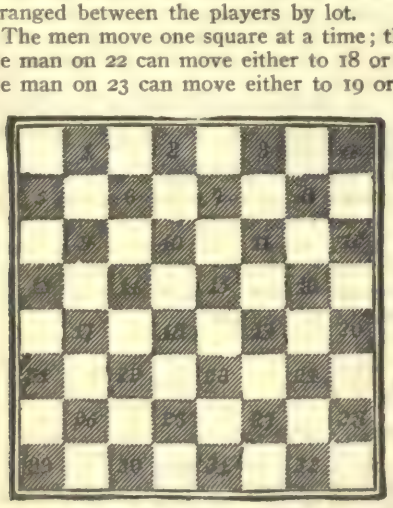
DRAUGHTS is played on the same board as chess, the men, however, being placed entirely on squares of one color.

There are twelve men on each side, arranged on the squares from 1 to 12 and from 21 to 32.

The two squares marked 1 and 5, and 32 and 28, are called the *double corners*, and these must always be on the right hand of the player, while the left-hand lowest squares, 4 and 29, must always be on the left-hand side.

Having placed the men, the first move is arranged between the players by lot.

The men move one square at a time; thus, the man on 22 can move either to 18 or 17; the man on 23 can move either to 19 or 18.



The men can only move forward, not backward, until they have succeeded in reaching the bottom row of the adversary's squares, when they are *crowned* by having a second man placed above them. They are then termed *kings*, and can move either forward or backward as desirable.

A man may *take* an opponent's man by leaping over him and taking up the vacant square beyond him, the piece taken being removed from the board.

A man may take two or three men at one move, provided he can leap over each in succession. To understand this, place a white man at 18, 11, and 25, and a black man at 29, all other pieces being removed from the board. The black man can move and take the three white men, as he can leap to 22, 15, and 8, thus taking the men on squares 18, 11, and 25. A king can take both backward and forward any number of men, as long as a square is open. Thus, place a white man on 25, 26, 27, 19, 10, 9, and 17. A black king at 29 could take all these men at once, for he could leap from 29 to 22, taking 25 man; to 31, taking 26; to 24, taking 27; to 15, taking 19; to 6, taking 10; to 13, taking 9; and to 22, taking 17, and taking all these in one move.

If a man take other men, and in the taking reach the bottom row, he can not go on taking, as a king, until the adversary has moved.

Example.—Place a white man at 24, 7, 16, and 8, a black man at 28. The black man takes 24 by leaping to 19, takes 16 by leaping to 12, takes 8 by leaping to 3, and is there crowned; but can not leap to 10, thus taking the man at 7, until the adversary has moved.

The game is won when all the adversary's men are either taken or blockaded so that they can not move, and it is drawn when two kings or less remain able to move, in spite of the adversary.

LAWS.—The following are the established laws of the game, which should be learned by every person who is desirous of becoming a draught-player.

RULES OF THE GAME

The chief laws for regulating the game of draughts are as follows:

1. Each player takes the first move alternately, whether the last game be won or drawn.

2. Any action which prevents the adversary from having a full view of the men is not allowed.

3. The player who touches a man must play him.

4. In case of standing the huff, which means omitting to take a man when an opportunity for so doing occurred, the other party may either take the man, or insist upon his man, which has been so omitted by his adversary, being taken.

5. If either party, when it is his turn to

move, hesitates above three minutes, the other may call upon him to play; and if, after that, he delay above five minutes longer, then he loses the game.

6. In the losing game, the player can insist upon his adversary taking all the men in case opportunities should present themselves for their being so taken.

7. To prevent unnecessary delay, if one color have no pieces but two kings on the board, and the other no piece but one king, the latter can call upon the former to win the game in twenty moves: if he does not finish it within that number of moves, the game to be relinquished as drawn.

8. If there are three kings to two on the board, the subsequent moves are not to exceed forty.

ADVICE.—The men should be kept as much as possible in a wedge form toward the centre of the board. Avoid moving a man on the side square, for, when there, he is deprived of half his power, being able to take in one direction only.

Consider well *before* you touch a man, for a man once touched must be moved.

Avoid the cowardly practice of moving a man, and then, when you discover by your adversary's move that you have committed an error, taking your move back. Stand the consequences though the game be lost, and next time you will be more careful. A game, even if won after replacing a man, is unsatisfactory, and not to be counted a victory, and often leads to disputes. The rules are made to avoid *all* argument and dispute, and the more closely, therefore, you obey these, the more harmonious will be your games.

GAMES

Draughts is a game in which one is particularly called upon to estimate the skill and style of play of one's adversary. One person may very easily be drawn into a trap, where another more cautious could not be thus defeated. Again, a too cautious player may be defeated by a dashing move, whereas another opponent would win the game in consequence. We will now give one or two examples of games, calling attention to the points in each. The men are supposed to be arranged as before mentioned—white's men from 21 to 32, black's from 1 to 12. Black moves first.

Black.	White.
11 to 15.	22 to 18.
15 to 22 (takes).	25 to 18 (takes).
8 to 11.	29 to 25.

Now, at this point of the game, if white were a very young or incautious player, he might be easily tempted into a false move by black moving 11 to 16, for white, seeing a supposed advantage in position, might move 24 to 20. Let us suppose these moves to have been made, and black wins at once, for, moving 3 to 8, he compels white to take 20 to 11, and then, with a man at 8, takes 11, 18, and 25, and procures a king at 29, thus gaining a majority of two men, an advantage equivalent to the game, for, by exchanging man for man on every occasion, he would soon reduce the odds to 4 to 2, or 2 to 0.

If, however, black play a more cautious game, he should move 4 to 8.

White again might lose the game if he moved either 24 or 23 to 19, for black would respond by 10 to 15, when white must move from 19 to 10, black from 6 to 29, taking these men as before.

Black's best move is, perhaps, 25 to 22.

At this period of the game exchanges of men usually take place, the object being an advantage of position, as follows:

Black.	White.
9 to 14.	18 to 9.
5 to 14.	24 to 20.
6 to 9.	22 to 18.
1 to 5.	28 to 24.

Up to the present time no great advantage is gained on either side, the game being, perhaps, slightly in favor of black, who may cause a separation in white's men by the following:

Black.	White.
9 to 13.	18 to 9.
5 to 14.	

White may reply by—

	23 to 18.

Then,

14 to 23.	27 to 18.

Now, unless black moves 2 to 6, or 10 to 15, white could procure a king as follows: Suppose black had moved 12 to 16, then white 18 to 14,

Black.	White.
10 to 17.	21 to 14.

and whatever black now does, white must procure a king. It is under such conditions as these that the acute player often wins a game; for we shall find that the eagerness for gaining this king may cause white to be in a difficult position. Carrying on the game under this supposition, we have

Black.	White.
16 to 19.	24 to 15.
11 to 18.	13 to 9.
8 to 11.	9 to 5.
18 to 22.	26 to 17.
13 to 22.	5 to 1 (king).
2 to 6.	1 to 10.
7 to 14.	32 to 28.
14 to 17.	28 to 24.
3 to 8.*	31 to 27.
8 to 12.	27 to 23.

* This move of black's will very likely lose him a man, or, at least, allow his adversary to make a king rapidly.

Black must now lose a man, and therefore the game, as follows:

Black.	White.
22 to 26, or 17 to 21.	23 to 18.
26 to 31, or 22 to 25.	19 to 15, and white wins

The Double Corners.—When there is one king against two, the rule is that the game is drawn unless it be won in at least twenty moves. If the player does not know how to block up in the double corners, this may easily be a drawn game. We will now show the moves for blocking in the double corners, giving the case that will require the greatest number of moves.

Black's kings at 1 and 5; white's at 10.

Black.	White.
5 to 9.	10 to 15.
9 to 14.	15 to 19.
14 to 18.	19 to 24.
18 to 23.	24 to 28 (reaches
1 to 6.	28 to 32. double
6 to 10.	32 to 28. corner.)
10 to 15.	28 to 32.
15 to 19.	32 to 28.
23 to 27.	28 to 32.
19 to 23.	32 to 28.
27 to 32.	28 to 24.
23 to 18.	24 to 19.
32 to 28.	19 to 16.
18 to 15.	16 to 20.
15 to 11, and wins in 15 moves.	

Had black moved from 15 to 19 at last, white could have gone to 24, and the game would have been prolonged. There is no position on the board where two kings can not defeat one in fifteen moves.

It is usual with two experienced players to pronounce the game drawn when there are two kings only on each side, one of which is enabled to reach the double corners. There are, however, two or three chances of catching an incautious player.

The following example will serve to illustrate cases. White's positions are king at 28 and at 30; black's at 24 and 19. Black moves.

Black.	White.
24 to 27.	28 to 32.
19 to 23.	30 to 26.
23 to 30.	32 to 23.
30 to 25.	23 to 26.
25 to 30.	26 to 22, and wins.

Another case may be tried with caution, and it is as follows, two kings each: black at 15 and 23; white at 16 and 25. White moves.

White.	Black.
25 to 22.	23 to 18.
16 to 11.	18 to 25.
11 to 18, and wins next move by blocking.	

These are not positions likely to entrap very good players, but succeed very often with average hands.

The game in these instances resulted in the winner having what is called "the move." To ascertain whether you have the move of any one of your adversary's men, examine the situation of each. If your opponent has a black square at a right angle under his man, you have the move, and *vice versâ*.

Draughts is in reality a deeply interesting game, and one that is very rarely appreciated.

THE LOSING GAME OF DRAUGHTS

The losing game of draughts is rarely understood, and therefore rarely appreciated. We believe that there is even more foresight required in the losing than in the winning game of draughts, for it is equally necessary to see several moves ahead, and the game may be almost instantly lost by a thoughtless move.

To win at the losing game we must compel our adversary to take all our men, and the novice usually commences by losing as many men as possible. This proceeding is an error; the player has the advantage who has the most men on the table, as will be instanced by one or two examples.

Suppose white to have a king on each of the four squares, 1, 2, 3, 4; black, one on 31. First, we will suppose that white commences thus:

White.	Black.
4 to 8.	31 to 27.
3 to 7.	27 to 23.
2 to 6.	23 to 18.
1 to 5.	

Black must now retreat, for, if he moves to 14 or 15, the game is lost, as he may be compelled to take each of his opponent's men in succession. Thus, suppose he move to 14:

White.	Black.
5 to 9.	14 to 5.
6 to 9.	5 to 14.
7 to 10.	14 to 7.
8 to 11 and wins.	

Thus black's move must be a retreat in answer to white's 1 to 5. Then,

Black.	White.
18 to 22.	5 to 9.
22 to 26.	6 to 14.
26 to 31.	14 to 18.
31 to 27.	

At this point, if white advanced from 18 to 23 to be taken, he would lose the game unless very careful, as the lost man would have the move against him. His best move, therefore, would be 18 to 25. If black moves to 24, he loses. Black had better move to 32, and white 6 to 10.

Black.	White.
32 to 28.	8 to 11.
28 to 32.	15 to 19.
32 to 28.	19 to 24.
28 to 19.	10 to 15.
19 to 3.	11 to 7, and wins.

We will now point out the best "traps" for the losing game.

Suppose white's men to be placed from 21 to 32. If then we can secure one of the adversary's men at 21, we are almost cer-

tain to lose all our men first, and thus to win the game, for, by keeping this man blocked until required, he can be made use of at the right time. Let us take an example, white moving first.

White.		Black.	
22 to 18.		9 to 14.	
18 to 9.		5 to 14	(Very bad
21 to 17.		14 to 21.	play; this
24 to 20.		11 to 16.	ought to
20 to 11.		7 to 16.	have been
23 to 18	(Not a good	10 to 15.	6 to 13.)
18 to 11.	move, but	8 to 15.	
28 to 24.	will serve	15 to 19.	
24 to 15.	to illus-	6 to 10.	
15 to 6.	trate the	1 to 10.	
26 to 22.	advantage	4 to 8.	
27 to 23.	of man at	16 to 19.	
23 to 16.	21.)	12 to 19.	
22 to 18.		10 to 15.	
18 to 4.		3 to 8.	
4 to 11.		2 to 7.	
11 to 2.			

White now has six men on the board, while black has only two; but white can reduce this number at any time by moving 30 to 26. Black can only move 19 to 24 or to 23. Suppose he move it to 23, then it will be better for white to reduce black to one as follows:

White.	Black.
31 to 27.	23 to 26.
30 to 23.	21 to 30.
29 to 25.	30 to 21.
32 to 28.	21 to 17.
28 to 24.	17 to 14.

If black move to 18, 10, or 9, he loses at once, so 14 to 17 is the best move. If white move 27 to 23 he loses the game, for black would move 17 to 22, from which white could not escape. Hence the game would be best played by

White.	Black.
2 to 6.	17 to 21.
6 to 10.	21 to 25.
10 to 14.	25 to 30.
14 to 17.	

The game might now be prolonged, but still to win the losing game with the four against one is almost a certainty, as it can only be lost by an oversight.

RULES FOR VARIOUS GAMES WITH DOMINOES

AFTER the dominoes have been well shuffled, each player draws one, and he who draws the domino containing the smallest number of pips wins "the down"; in plainer English, he wins the privilege of playing first. Sometimes a different method of deciding who shall have "the down" is adopted. One of the players draws a domino, and without showing it, asks if it is odd or even. If the adversary guesses right he wins "the down"; if, on the contrary, he guesses wrong, he loses it. The latter method is the more common of the two. A third method is in use on the Continent. The person holding the highest double has the "*pose*," or "down," and he commences by playing that domino. If there should be no doubles, then the person holding the highest domino has the *pose*. However, it is quite immaterial which of these plans is adopted. The dominoes having been shuffled, each player takes six or seven, as may be agreed upon.

If it is found that one of the players has drawn more than the number agreed upon, his adversary withdraws the extra number, and puts them back on the heap, keeping the face downward, of course. Each player then takes up his dominoes, and the first player commences by putting down one of his dominoes, after which his adversary joins one to it, containing on one of its sections the same number of pips as are marked upon adjoining section of the domino first played. They thus play alternately till the game may become so "blocked" that one of the players can not "go." His adversary will then continue to play as long as there is an end open. If he should succeed in getting rid of all his men he wins the game; but if the game should be blocked at both ends before either player has played out, they compare the aggregate number of pips on all the dominoes in each hand, and whoever has the smallest number wins the game.

GENERAL MAXIMS

1. Endeavor to play so as to keep both ends open, so that you may be sure of being able to "go" next time.

2. Play out your heavy dominoes first, because, if the game becomes blocked, you will then have fewer pips to count.

3. Contrive to play so that the numbers at both ends shall be those of which you hold the most. By this means you may often block your adversary till you are played out.

4. If you have made both ends alike, and your adversary plays, follow him at that end, as the chances are that he can not go at the other, which you may keep open for yourself until you are unable to play at his end.

5. It is sometimes an advantage to hold heavy dominoes, as they not infrequently enable you to obtain what is called a good

"follow"; and if your adversary should hold none but low dominoes, he would not be able to go, thus enabling you to play five or six times consecutively, or even to play out.

6. When you have sole command over both ends you are generally in a position to "block" the game or not, as you think most expedient for your own game. In such a case, you must be guided by the number of dominoes you hold compared with those in your adversary's hands; and another element for your consideration would be whether yours are light or heavy. If they are light, and fewer in number than your adversary's, of course your best policy is to close the game at once and count. But in this you must learn to calculate from your adversary's style of play whether his hand is light or heavy.

7. At the commencement of the game it is better to have a variety in hand.

8. If you hold a "double," with two of the same number, it is better to play the double before either of the others. Sometimes you will be obliged to play one, in which case you must endeavor to force the double.

9. If you hold a double, and one other of the same number, play both consecutively; but if you are unable to do that, endeavor at any rate to let the double go first.

10. In playing against "the down," endeavor to deceive your opponent by playing a domino or two at each end indifferently. This is better than playing to his last domino, as it leads him to believe you can not go at that end, while at the same time you may be simply keeping both ends open.

11. If your adversary has possession of one end, make the other of a number of which you hold several, with a view of forcing him to play at his end, and shutting it against the dominoes he was keeping it for.

12. If you hold several doubles, wait till your adversary makes the number for them in preference to making them for yourself; otherwise, a good player will see what you are aiming at, and will block the double. But if you hold a double with several duplicates, and can bring that number at both ends, do so.

13. If your adversary can not go at one end, and you hold the double of that end, it is better that you should play at the other as long as you can. When you are blocked at that end, you may then play your double, and your adversary will then in most cases be obliged to open the other end for you.

14. It is generally considered that a light hand, yet with no number missing, is the best for ordinary play. The following, for example, would be a very fine hand: 6—3, 5—4, 2—1, 1—0, 2—0, 0—0. An example of a bad hand would be: 6—6, 5—5, 6—2, 2—2, 2—1, 1—1; but the worst possible hand would be the following: 6—6, 5—5, 4—4, 3—3, 2—2, 1—1. The latter, however, would seldom occur in actual play.

15. It does not necessarily follow that because a hand is heavy it must therefore lose. Provided it is equally varied, it has an equal chance of success with a light hand. The disadvantage of a heavy hand is shown when the game becomes blocked, and has to be decided by counting.

16. In leading "the down" from a hand consisting of a high double and several light dominoes, lead the double, and afterward endeavor to obtain command of both ends. Suppose, for example, you hold the following hand: 5—5, 2—2, 2—3, 2—4, 1—0, 5—0; it would be better to play the 5—5, as your other double can be forced by the aid of the 2—4 and 2—3

17. It will at all times be found a difficult thing, in an equal game and between equal players, for the second player to win.

18. Endeavor to bring both ends as often as you can to a number of which you have several duplicates, for by that means you may block your adversary.

19. In blocking the game, you must be cautious that you do not block it to yourself, and leave it open to your adversary.

20. During the game look over the dominoes which have been played, so that you may calculate what numbers are likely to be soon run out, and what numbers your opponent is likely to be short of.

21. Do not push the game to a block if you hold a heavy hand, but play out your heaviest first, and keep both ends open.

22. Use your judgment freely. It is not always the best policy to adhere too strictly to the rules laid down in books. In fact, a wily player will oftentimes find it expedient to play a speculative, eccentric game, apparently quite at variance with the ordinary "laws."

23. Keep perfectly quiet, attentively watch your opponent's moves, and prevent him, if you can, from obtaining an insight into your play.

24. Last (though not least), don't lose your temper.

ALL FIVES

This game stands next in popularity to the preceding one. The same number of dominoes are taken, or as many as may be agreed upon, and in many points it is similar. The object of the game is to contrive so to play that the aggregate number

of pips on the dominoes at both ends shall number 5, 10, 15, or 20. If they number 5, the player who makes the point counts one; if 10, two; if 15, three; if 20, four.

In order to make our meaning clearer, we give an illustration. Suppose that at one end there is 0—0, and at the other a five. The next player then plays 5—5 to the single five, and scores two, because the aggregrate number of pips on the dominoes at both ends is ten. If the opponent should follow up by playing the 0—5 to the 0—0, he, of course, scores three.

To give another illustration. Suppose at one end is 6—6, and the next player places at the other end 4—4, he scores four for making twenty.

If the game becomes blocked, he who holds the least number of pips counts one.

The custom as to what number shall be "up" is different in different parts of the country. In some places it is ten; in others fifteen; in others again, twenty. The number ought to be agreed upon at the commencement of the game. In our opinion it adds to the interest of the game to select the lower numbers.

Sometimes the game is so played that he who makes five counts five; ten is made to count ten, and so on; but in that case not fewer than 50, and not more than 100, points should constitute the game.

As we have shown, the material point in which this game differs from the previous one is that you count the fives, from which circumstance it derives its name.

The next best thing to making fives yourself is to prevent your adversary from doing so; and when you do give him the opportunity of making a point it should only be in order that you may make two or three points yourself.

When your adversary fails to avail himself of a good chance, you may presume that he does not hold such and such dominoes, and from that and like indications, which you must carefully store up in your memory, you will be able to form a tolerably accurate estimate of his hand. You should never omit to turn these indications to good account.

There is only one domino in the whole pack which can be led without the next player being able to make a point from it; namely, 2—3. Always lead that if possible.

If you must play one of two dominoes, either of which you fear your adversary will turn to his account, of course you must play that by which you think you will be likely to lose the least.

It is good practice occasionally to take a survey of the game as far as it has gone, not only in order to refresh your memory as to what has been played, but also that you may form an opinion, if possible, of what your opponent's "little game" is. If there are good grounds for coming to the conclusion that he holds heavy numbers while you hold light ones, block up the game as speedily as you can, and proceed to count. To understand your opponent's hand is a most important matter, and we do not think we have insisted on it too much. Good players will tell you that they have won many games by watching closely the opponent's moves, and drawing therefrom inferences respecting the dominoes he holds in hand. We need not add, the greatest caution must be used in forming these inferences.

THE DRAWING GAME

The same number of dominoes are used, and the lead is drawn for in the same manner in this as in the previously described games.

The difference is that when a player can not go, he must draw a domino from the pack. If he can not then go, he must draw another, and so on until he is able to continue the game.

He who plays out first, or, in case the game becomes blocked, he who holds the smallest number of pips, wins.

The French have a different way of playing this game. The player who holds the highest double, or, in the event of there being no double, the highest domino, has the *pose* or lead. The second player, should he be unable to go, may draw all the remaining dominoes except two, which must remain untaken. If he leave more than two, the first player, should he require them in order to continue the game, may appropriate the surplus, still leaving two on the table.

If a player can not go, it is compulsory that he draw till he gets hold of a domino that will enable him to continue the game.

Each player may take the *pose* alternately, or the winner in the first instance may retain it, as agreed upon.

The French method of counting is also different. When a player has played out, he counts the pips in his opponent's hand, and scores them to his own account. In case the game should become blocked, the player holding the fewest pips scores the number of pips in his adversary's hand to his own account, each pip counting one. A game consists of from 20 to 100 points, according to agreement.

With respect to the English method of playing this game, the general instructions and maxims given on the other games apply equally to this. But a few words must be added with regard to the French play. He who has the highest double is compelled to play first, and can not draw any more dominoes until it is his turn to play again, but his opponent may draw all but two, which two must remain untaken during that game. But the second player should not draw more than half the dominoes, unless really compelled by the badness of his hand, as by this means it will leave a chance of his opponent having as many to draw. A good player at times might be justified in taking all but two, for by the calculation and judgment obtained by having them, he might be enabled to play them all before his opponent could play his five or six dominoes, as the case may be. Should the second player hold a good hand, comprising dominoes of every denomination, he should not draw until compelled. If he should happen to draw high doubles, he ought to continue to draw until he holds several of that number.

It is not always the player holding the greatest number who gets out first, because as he has some of almost every denomination, his adversary will keep playing to him, and the odds are that he (the adversary) will be able to play out first. Still, in many games, the one holding the largest number of dominoes possesses this advantage, that he has the power to keep both ends open to himself, but closed to his opponent, and he may thus run out.

In order to be able to play out first with the largest number (supposing that only two dominoes remain untaken), you should by all means, and in the first place, endeavor to ascertain what those two are. You may arrive at this in two ways. Suppose you hold so many of a particular number that with those already played they make six out of the seven of that denomination, you must by all means keep playing them.

As an illustration, we will suppose you hold in your hand four threes, and that two other threes have already been played. Now, if you play your threes, and your adversary, not being able to play to them, becomes blocked, it is quite clear that one of the dominoes on the table is a three. Then, if those you hold in your hand are 3—2, 4—3, 3—6, and 3—3, and you find among the dominoes played 3—0 and 3—1, it is, of course, quite safe to conclude that the domino which is left is the 3—5.

The second plan is this. If during the course of the game you have given your opponent opportunities of playing a certain double which you do not yourself hold, you may be certain that it is one of the left dominoes.

A little experiment, in order to test the nature of your adversary's hand, so as, however, not materially to injure your own, would often be found more expedient than groping all the while, as it were, in the dark.

By carefully looking over your own hand, you may judge pretty correctly as to whether your adversary's is light or heavy.

It is only by taking into account all these and other nice points that a player can possibly be successful.

Having formed an idea of your opponent's hand, you should make it an object to "run out," or play so that he may be blocked, or that he may be obliged to leave both ends open for you to play out.

Having given some instructions to the player who holds the larger number of dominoes, we must now proceed to give a few hints to the lesser hand.

If, holding the lesser hand, you can contrive to play a few moves at first without being blocked, you ought to be pretty sure of winning; because, by that time, your hand will have become so disproportionately small that your opponent will have some difficulty in preventing you from playing out without blocking himself. This, therefore, must be one of your main objects.

If the game goes pretty equal, bring out your strong suits. Wherever you are short of a particular suit, if you find that many of that number have already been played, you need not fear that your adversary will be able to block you in regard to it, for you will, of course, infer that they are as scarce in his hand as in your own. Endeavor to bring these rules to bear, reserving to your discretion as to whether you should in any wise depart from them, or use such modifications as the contingencies of the moment require.

THE MATADORE GAME

This is a foreign game, and each player takes only three dominoes. You can only play when your domino, added to the one previously played, would make seven. Those dominoes which themselves make that number are termed "matadores," and may be played at any time, regardless of the numbers played to. The double blank is also a matadore. The matadores, therefore, are four in number, viz.: 6—1, 5—2, 4—3, 0—0.

The highest domino leads, and if the next player can not go, he must draw from the

heap until he can. He must cease, however, to draw when there are only two dominoes left. He who plays out first wins, and if the game is blocked, he who holds the least number of pips counts those held by his opponent, and scores them to his own game. The number of points constituting the game is subject to agreement; it varies from 26 to 100.

MAXIMS FOR PLAYING THE MATADORE GAME

This game differs widely from any of the other varieties of dominoes. The element of chance is more largely introduced. The player who happens to obtain more matadores than the other is almost certain of winning, provided the parties be pretty evenly balanced in skill and experience.

The blanks are very valuable at this game —the double blank being the most valuable of all the matadores. It is impossible to make a seven against a blank, so that if you hold blanks you may easily block the game and count.

When you have the worst of the game, and indeed at other times as well, guard against your adversary's blanks, and prevent him from making them; which you may do by playing only those dominoes which fit with the blanks already down.

Never play a blank at the *pose* unless you have a matadore or a corresponding blank.

Keep back your double blank till your opponent makes it blanks all; you can then force him to play a matadore, or compel him to draw till he obtains one. It is better to have a mixed hand.

DOMINO POOL

This game is played either by partners or by separate players. If played singly by three or four players, each must draw a domino, and he who draws the highest number of pips but one sits on the left of him who draws the highest, the next highest to the left of the second, and so on. If the game is played by partners, the two lowest are partners and the two highest. The partners must sit opposite to each other. The players must draw afresh at each game, and the stake to be played for, called the "pool," must be placed on the table.

Each player takes five dominoes, and he who holds the highest leads. When one player can not go, the next in turn plays, and so on. The maxims given in reference to the English game apply equally to this.

The game is scored in the following manner: When one player has played out, the one keeping the score counts the number of pips on each player's remaining dominoes, and puts down the number under each of their names or initials respectively. The same is done if a player can not go. When the number of any one player reaches 40, 50, or 100, or any limit previously agreed upon, he is out of the game; but he comes in again by what is called "starring." In other words, he must pay over again the amount he originally put into the pool. The method of "starring" is the same as at billiards, from which the game is taken. He who "stars" recommences at the number which the player holds who is in the worst position. Suppose, for example, there were three players—one at 20, one at 40, and the other at 60, 100 being up, the player who "stars" must recommence at 60. He can only "star" once, and that must be at the time he is out. Each player has the option of "starring," except the last two, who must divide the pool, or they may agree to play it out. Still, unless an agreement to play out is made beforehand, the last two must divide.

INSTRUCTIONS FOR PLAYING DOMINO POOL

When this game is played by separate players, and one becomes greatly ahead, the other three can combine, so as to render his chance of winning uncertain. The necessity of this combination is clear. If he is allowed to win, the competition for that game is over; but if, by combining, the other players can keep him back a little, they obtain for themselves a better chance of success. The player who is ahead will also do his best to throw obstacles in the way of the player in the next best position, as he becomes a dangerous competitor. The two in the worst position will in like manner combine against the two ahead. The necessity for this combination does not arise till the game is somewhat advanced, as at the beginning all the players are on a level; and the relative position of the others is of no moment till the game becomes advanced. It is of very little use for *one* player to attempt to stop the progress of another who is too far ahead, unless the others combine with him. If, through ignorance or anything else, they continue to play for their own hands, you must do likewise. Although, if you attempted by yourself to stop the player who was ahead of you, you might succeed, that success might be purchased at the risk of your own chance in the game. As in this game you have only five dominoes out of twenty, your power of influencing the game is very much diminished, and there is not

quite so much scope for the exercise of your judgment as in other single games where you hold six dominoes out of twelve. Your opponents are sure to hold some of the remaining numbers in which you are strong; so that the injury you can in other games inflict by having a preponderance of a particular number will be greatly diminished here. Therefore it is scarcely worth your while endeavoring to retard your opponent's game when you have three of a number, unless some of that number have already been played; because, if you keep those numbers until you are called upon to play them, you will do infinitely more toward crippling their game than if you were to lead from them. On the other hand, should you hold *more* than three of a particular number, do not wait for this chance, but lead it on the first opportunity. If you find that you and one of the other players hold nearly all of a particular number, combine with him, in order to exhaust the hands of the other two. In doing this you are of course only studying your own interest. It is better to adopt this plan when you have reason to believe you are already on the safe side. If you hold one or two doubles, with duplicates of either, retain the latter until you first get rid of the doubles; but if you hold three or four duplicates along with a double, play the duplicates at once, as you will be able by your own hand to force the double at any time. If you are short in any particular number, get rid of your heavy dominoes as quickly as possible. In playing off you may lead with a light domino, if you hold one or more of the number; but if not, you must lead a higher domino, in order to diminish the number of pips in your hand. If you hold a heavy hand with high doubles, or a hand which admits of little or no variety, or without any particular preponderance, you must play a safe game, and sustain as little loss as you possibly can under the circumstances. Endeavor to balance the inferiority of your hand by drawing the other players along with you.

When there are only three players left, and one is greatly ahead, while another has starred, it should be the object of the third player to prolong the game as much as possible, as he still has a chance to star.

When two players are in advance, the two behind must avoid embarrassing each other in their combinations against the other two. It is better for them to use their joint efforts against one at a time, as the attack, if concentrated in that way, would be stronger and more effectual. Should one of the advanced players get embarrassed, endeavor to embarrass him still more, for you may be sure his competitor will not assist him.

It will be perfectly understood, however, that, in playing with partners, the object of each partner will be to play as much as possible into his partner's hands and to cripple his opponents. If it is your lead and you have a good hand, you must try and win with it, regardless of your partner's position. So, on the other hand, if it is your partner's down, and you have a bad hand, you must be content to sacrifice your own chance in order to increase his. In the partner's game it is generally good play to lead from a strong suit, for, as this is a generally understood rule, your partner will accept the hint, and will not fail to "return your lead," or, in other words, to play into your hands as much as possible. If you hold some doubles, with others of the same number, you may—contrary to the single game—play the latter first if it suits your hand, as your partner will be sure to assist in getting out your doubles.

We might continue these directions and hints *ad infinitum*, but experience, after all, is the best teacher; and—recommending the learner to practice assiduously and play carefully—we dismiss this portion of our subject.

THE WHIST GAME

This game resembles in some points the game of cards from which it takes its name. It is played by four persons—two partners on each side. The partners, as usual, sit opposite to each other. The whole of the dominoes are taken—seven by each player.

It is best to lead from your strongest suit. By this and such other indications you will enable your partner to form an opinion as to your hand, by which he will be guided very much in his play, and as the game proceeds each must tax his recollection as to who played such and such a domino, and how the game stood at that particular time, so as to form a judgment as to the motive of such play, etc. The general instructions given in the previous pages will apply in great measure to this game, particularly those given in reference to the Pool Game.

THE FOUR GAME

In this game, which is played by four persons, each player takes seven dominoes; and he who plays out first, or, if the game becomes blocked, holds the least number of pips, wins the hand, and draws a certain stake from the other three.

Very little in the way of instruction is re-

quired in this game. If you have the *pose,* you should play out as far as possible, and then endeavor to block the game.

Endeavor to keep your hand even, so as to be ready at any number, or (and in this you must be guided by the nature of your hand) play to keep your strongest suit in hand until those of the same suit held by other players are out. By this means you may oftentimes be able to play out or shut the game, as you find most expedient.

SEBASTOPOL GAME

This game is played by four players, each taking seven dominoes. The player holding the double six plays it, and takes the lead. Each player must play a six to it. He who can not loses the turn. The dominoes are played in the form of a cross the first round, after which the players alternately play at either of the four ends. He who has the last domino, or, in the event of more than one player being left with dominoes when the game is shut, he who holds the greatest number of pips, pays a certain amount to the winners.

Endeavor to get rid of your heavy dominoes, and put obstacles in the way of your adversaries running out.

TIDDLE-A-WINK GAME

This is a very amusing game, and suitable for a round party.

If six or more play, each takes three dominoes. The 6—6 is then called for, as in the French game, and the person holding it leads with it. If it is not out, the next highest double is called forth, and so on downward until a start is made.

In this game, he who plays a double, either at the lead or at any other part of the game, is entitled to play again if he can—thus obtaining two turns instead of one. The game then proceeds in the ordinary way, and he who plays out first cries "Tiddle-a-wink!" having won. In the event of the game being blocked, he who holds the lowest number of pips wins.

PARLOR MAGIC

THE ability to perform successfully even the simplest tricks included under the general head of magic is an art that must be carefully learned and practiced. It includes not only the knowledge of *how* a thing is done, but also the knowledge of how to do it yourself. As we progress in this world, we learn that these two things, which very many people suppose to be identical, are as far apart as good and evil, or as East and West. In no branch of art and science do we need the lesson more than in what is known as "magic," or sleight-of-hand.

In the following treatise only such tricks will be noticed as are of a nature suitable for production, without complicated apparatus, and, as far as possible, require very little practice. The expression, "little practice," however, is strictly relative: there is no "royal road" to mystic knowledge. A celebrated magician, being asked for three rules to apply to magic, replied: "First, practice; second, practice; third, practice." Another rule of importance is never to tell your audience beforehand what you are about to do. Forewarned is forearmed. Even expert magicians are deceived by a new trick; not knowing what is to be done, they can not tell where to watch, being, therefore, as much mystified at its completion as the merest layman would be.

Every trick should be clothed, as it were, with appropriate talk, called by magicians "patter." This should not be too lengthy; only long enough to explain the point of the trick, and to hold the interest of the audience. The performer should carefully cultivate a smooth and finished manner, which is a large part of the science of *misdirection*, which is the real foundation of all sleight-of-hand.

By misdirection, it will be understood, is intended the art of causing the audience to look at the wrong place, when the critical point of a trick is reached. To this end, the performer should practice using the hands without looking at them; since the attention of an audience will always follow the performer's eyes. If he himself watches his hands, while making any movement he does not wish the spectators to see, they will infallibly look at his hands also. So far as is possible, arrange your programme so that one trick will logically follow another. Furthermore, rehearse each trick carefully before performing it at all.

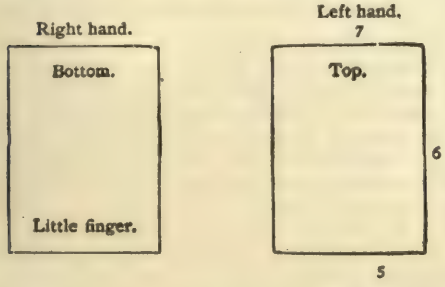
SIMPLE TRICKS WITH CARDS

A FEW preliminary hints are necessary in order to enable an amateur to perform the tricks he attempts with effect and success.

A conjurer should always be able to "palm" well. That is done by holding a coin in the fingers, and by a quick movement passing it into the middle or palm of the hand, and, by contracting the muscles on each side of the hand, to retain it there, making the hand appear open and as though nothing were in it. After a little practice this will become comparatively easy, but it will require the exercise of great perseverance in order to become perfect. The pains, however, will be well bestowed, as this is one of the principal means by which prestidigitators deceive their audiences.

MAKING THE PASS

In many of the tricks with cards it is necessary to "make the pass," as it is termed, which is a very neat and simple movement. The operator shows a card, which he wishes his audience to believe he can change by simply using the mysterious words "Presto, begone!" While, however, he is saying these words, he gives a



sharp blow on the pack he holds in his hand, and at the same time slips the card under the pack and takes off the top one, or *vice versa*. Practice, in this as in other matters, will impart great dexterity to the operator; and, as the hand can be trained to move more quickly than the eye can see, he will be able to go through the movement without it being perceived by his audience.

The following mode of "making the pass" should be well studied: Hold the pack of cards in your left hand so that the palm of your hand may be under the cards; place the thumb of that hand on one side of the pack, and the first, second, and third fingers on the other side, and your little finger between those cards that are to be brought to the top and the rest of the pack. Then place your right hand over the card in such a manner that the thumb may be at 5, the forefinger at 6, and the other fingers at 7, as in the above figure:

The hands and the two portions of the pack being thus disposed, you draw off the lower cards confined by the little finger and the other parts of the right hand, and place them with an imperceptibly quick motion on top of the pack.

But before you attempt any of the tricks that depend upon "making the pass" you must have great practice, and be able to perform it so dexterously and expeditiously that the eye can not detect the movement of the hand, or you may, instead of deceiving others, expose yourself.

FORCING A CARD

In card tricks it is frequently necessary to "force a card," by which you compel a person to take such a card as you think fit, while he imagines he is taking one at haphazard. The following is, perhaps, the best method of performing this trick:

Ascertain quietly, or while you are amusing yourself with the cards, what the card is which you are to force; but either keep it in sight, or place the little finger of your left hand, in which you have the cards, upon it. Next, desire a person to select a card from the pack, for which purpose you must open them quickly from left to right, spreading the cards backward and forward so as to perplex him in making his choice, and when you see him about to take one, open the pack until you come to the one you intend him to take, and just at the moment his fingers are touching the pack let its corner project invitingly a little forward in front of the others. This will seem so fair that in nine cases out of ten he will take the one so offered, unless he is himself aware of the secret of forcing. Having by this method forced your card, you request him to examine it, and then give him the pack to shuffle, which he may do as often as he likes, for you are of course always aware what card he has taken. A perfect acquaintance with the

art of forcing is indispensably necessary before you attempt any of the more difficult card tricks.

TO TELL A CARD BY SMELLING IT

A very clever trick, and one which never fails to excite astonishment at an evening party, is to select all the court cards when blindfolded; but before commencing it, you must take one of the party into your confidence, and get him to assist you. When all is arranged, you may talk of the strong sense of smell and touch which blind people are said to possess, and state that you could, when blindfolded, distinguish the court cards from the rest, and profess your willingness to attempt it. The process is this: After you have satisfied the company that your eyes are tightly bound, take the pack in your hands, and holding up one of the cards in view of the whole company, feel the face of it with your fingers. If it is a court card, your confederate, who should be seated near to you, must tread on your toe. You then proclaim that it is a court card, and proceed to the next. Should you then turn up a common card your confederate takes no notice of it, and you inform the company accordingly; and so on until you have convinced the company that you really possess the extraordinary power to which you laid claim.

TO CHANGE A CARD BY WORD OF COMMAND

It at first sight seems singular that any one should be able even to appear to change a card by word of command; yet it can easily be done, and under different titles, and with slight variations, the trick is constantly performed in public. To do it, you must have two cards alike in the pack—say, for example, a duplicate of the king of spades. Place one next to the bottom card, which we will suppose to be the seven of hearts, and the other at the top; shuffle the cards without displacing these three, and then show one of the company that the bottom card is the seven of hearts. This card you dexterously slip aside with your finger, so that it may not be perceived, and taking the king of spades from the bottom, which the person supposes to be the seven of hearts, lay it on the table, telling him to cover it with his hand. Shuffle the cards again without displacing the first and last cards, and shifting the other king of spades from the top to the bottom, show it to another person. You then contrive to remove the king of spades in the same manner as before, and taking the bottom card, which will then be the seven of hearts, but which the company will still suppose to be the king of spades, you lay that also on the table, and tell the second person to cover it with his hand. You then command the cards to change places, and when the two parties take off their hands, they will see, to their great astonishment, that your commands are obeyed.

"TWIN CARD" TRICK

Another trick performed by means of "twin," or duplicate, cards, as in the previous case, is to show the same card apparently on the top and at the bottom of the pack. One of these duplicate cards may be easily obtained; in fact, the pattern card, which accompanies every pack, may be made available for that purpose. Let us suppose, then, for a moment, that you have a duplicate of the queen of clubs. You place both of them at the bottom of the pack, and make believe to shuffle them, taking care, however, that these two keep their places. Then lay the pack upon the table, draw out the bottom card, show it, and place it on the top. You then command the top card to pass to the bottom, and, on the pack being turned up, the company will see with surprise that the card which they had just seen placed upon the top is now at the bottom.

THE VANISHING CARD

Another good trick is thus performed: Divide the pack, placing one-half in the palm of the left hand, face downward; and, taking the remainder of the pack in the right hand, hold them between the thumb and first three fingers, taking care to place the cards upright, so that the edges of those in your right hand may rest upon the back of those in the left, thus forming a right angle with them. In this way the four fingers of the left hand touch the last of the upright cards in your right hand. It is necessary that the cards should be placed in this position, and that once being attained, the rest of the trick is easy. These preliminaries having been gone through, one of the company, at your request, examines the top card of the half-pack that rests in the palm of your left hand, and then replaces it. Having done this, you request him to look at it again, and, to his astonishment, it will have vanished, and another card will appear in its place. In order to accomplish this, having assumed the position already described, you must damp the

tips of the four fingers that rest against the last card of the upright set in your right hand. When the person who has chosen a card replaces it, you must raise the upright cards in your right hand very quickly, and the card will then adhere to the damped fingers of your left hand. As you raise the upright cards, you must close your left hand skilfully, and you will thereby place the last of the upright cards—which, as we have explained, adheres to the fingers of your left hand—upon the top of the cards in the palm of your left hand, and when you request the person who first examined it to look at it again, he will observe that it has been changed. Rapidity and manual dexterity are required for the performance of this capital sleight-of-hand trick.

TO SEND A CARD THROUGH THE TABLE

Request one of the company to draw a card from the pack, examine it, and then return it. Then make the pass—or, if you can not make the pass, make use of the long card—and bring the card chosen to the top of the pack, and shuffle by means of any of the false shuffles before described, without losing sight of the card. After shuffling the pack several times, bring the card to the top again. Then place the pack on the table, about two inches from the edge near which you are sitting, and having previously slightly dampened the back of your right hand, you strike the pack a sharp blow, and the card will adhere to it. You then put your right hand very rapidly underneath the table, and taking off with your left hand the card which has stuck to your right hand, you show it to your audience, who will at once recognize in it the card that was drawn at the commencement of the trick. You must be careful while performing this trick not to allow any of the spectators to get behind or at the side of the table, but keep them directly in front, otherwise the illusion would be discovered.

TO KNOCK ALL THE CARDS FROM A PERSON'S HAND EXCEPT THE CHOSEN ONE

With a little care a novice may easily learn this trick. It is not new, and is called by some the "Nerve Trick." Force a card, and request the person who has taken it to return it to the pack and shuffle the cards. Then look at the card yourself, and place the card chosen at the bottom of the pack. Cut them in two, and give him the half containing his card at the bottom, and request him to hold it just at the corner between his finger and his thumb. After telling him to hold them tight, strike them sharply, and they will all fall to the ground except the bottom one, which is the card he has chosen. An improvement in this trick is to put the chosen card at the bottom of the pack and turn the face upward, so that when you strike, the card remaining will stare the spectators in the face.

TO TELL THE NAME OF A CARD THOUGHT OF

One of the company must, at your request, draw seven or eight cards promiscuously from the pack, and select one from among them as the card he desires to think of. He then returns them to the pack, and you, either by shuffling or in any other way which will not be noticed, contrive to pass the whole of them to the bottom of the pack. You then take five or six cards off the top of the pack, and throw them on the table face upward, asking if the card thought of is among them. While the person is examining them you secretly take one card from the bottom of the pack and place it on the top; and when he tells you that the card he thought of is not in the first parcel, throw him five or six more, including the card you have just taken from the bottom —the denomination and suit of which it is presumed you have taken the opportunity to ascertain—so that should he say that his card is in the second parcel, you will at once know which card is indicated, and in order to "bring it to light," you may make use either of the two foregoing tricks, or any other you think proper.

TO TELL THE NAMES OF ALL THE CARDS BY THEIR WEIGHTS

The pack having been cut and shuffled to the entire satisfaction of the audience, the operator commences by stating that he undertakes, by poising each card for a moment on his fingers, to tell not only the color, but the suit and number of spots, and, if a court card, whether it be king, queen, or knave. For the accomplishment of this most amusing trick we recommend the following directions: You must have two packs of cards exactly alike. One of them we will suppose to have been in use during the evening for the performance of your tricks; but in addition to this you must have a second pack in your pocket, which you must take care to arrange in the order here-

inafter described. Previous to commencing the trick you must take the opportunity of exchanging these two packs, and bringing into use the prepared pack. This must be done in such a manner that your audience will believe that the pack you introduce is the same as the one you have been using all the evening, which they know has been well shuffled. The order in which the pack must be arranged will be best ascertained by committing the following lines—the words in italics forming the key:

Eight kings threa-ten'd to save,
Eight, king, three, ten, two, seven,
Nine fair ladies for one sick knave,
Nine, five, queen, four, ace, six, knave.

These lines thoroughly committed to memory will be of material assistance. The alliterative resemblance will in every instance be a sufficient guide to the card indicated. The order in which the suits should otherwise be committed to memory —viz., *hearts, spades, diamonds, clubs.* Having sorted your cards in accordance with the above directions, your pack is "prepared" and ready for use; and when you have successfully completed the exchange, you bring forward your prepared pack, and hand it round to be cut. The pack may be cut as often as the audience pleases, but always whist fashion—*i.e.*, the lower half of the pack must be placed upon the upper at each cut. You now only want to know the top card, and you will then have a clew to the rest. You therefore take off the top card, and holding it between yourself and the light, you see what it is, saying at the same time, by way of apology, that this is the old way of performing the trick, but that it is now superseded. Having once ascertained what the first is, which, for example, we will suppose to be the king of diamonds, you then take the next card on your finger, and poise it for a moment, as if you were going through a process of mental calculation. This pause will give you time to repeat to yourself the two lines given by which means you will know what card comes next. Thus: "Eight kings threa-ten'd to," etc.; it will be seen that the three comes next.

THE QUEEN'S DIG FOR DIAMONDS

Taking the pack in your hands, you separate from it the four kings, queens, knaves, and aces, and also four common cards of each suit. Then laying the four queens, face upward, in a row on the table, you commence telling your story somewhat after this fashion:

"These four queens set out to seek for diamonds. [*Here you place any four cards of the diamond suit half over the queens.*] As they intend to dig for diamonds, they each take a spade. [*Here lay four common spades half over the diamonds.*] The kings, their husbands, aware of the risk they run, send a guard of honor to protect them. [*Place the four aces half over the spades.*] But fearing the guard of honor might neglect their duty, the kings resolve to set out themselves. [*Here lay the four kings half over the four aces.*] Now, there were four robbers, who, being apprised of the queens' intentions, determined to waylay and rob them as they returned with the diamonds in their possession. [*Lay the four knaves half over the four kings.*] Each of these four robbers armed himself with a club [*lay out four clubs half over the knaves*]; and as they do not know how the queens may be protected, it is necessary that each should carry a stout heart." [*Lay out four hearts half over the knaves.*]

You have now exhausted the whole of the cards with which you commenced the game, and have placed them in four columns. You take the cards in the first of these columns, and pack them together, beginning at your left hand, and keeping them in the order in which you laid them out. Having done this, you place them on the table, face downward. You pack up the second column in like manner, lay them on the first, and so on with the other two.

The pack is then handed to the company, who cut them as often as they choose, provided always that they cut whist fashion. That done, you may give them what is termed a shuffle-cut; that is, you appear to shuffle them, but in reality only give them a quick succession of cuts, taking care that when you are done a card of the heart suit remains at the bottom.

You then begin to lay them out again as you did in the first instance, and it will be found that all the cards will come in their proper order.

MYSTERIOUS DISAPPEARANCE OF THE KNAVE OF SPADES

Fixing your eye upon the stoutest-looking man in the room, you ask him if he can hold a card tightly. Of course he will answer in the affirmative; but if he should not, you will have no difficulty in finding one who does. You then desire him to stand in the middle of the room, and holding up the pack of cards, you show him the bottom one, and request him to state what

card it is. He will tell you that it is the knave of spades. You then tell him to hold the card tightly and look up at the ceiling. While he is looking up you ask him if he recollects his card; and if he answer, as he will be sure to do, the knave of spades, you will reply that he must have made a mistake, for if he look at the card he will find it to be the knave of hearts, which will be the case. Then handing him the pack, you tell him that if he will look over it, he will find his knave of spades somewhere in the middle of the pack.

This trick is extremely simple and easy of accomplishment. You procure an extra knave of spades, and cut it in half, keeping the upper part, and throwing away the lower. Before showing the bottom of the pack to the company, get the knave of hearts to the bottom, and lay over it, unperceived by the company, your half knave of spades; and under pretence of holding the pack very tight, you put your thumb across the middle, so that the joining may not be seen, the legs of the two knaves being so similar that detection is impossible. You then give him the lower part of the knave of hearts to hold, and when he has drawn the card away hold your hands so that the faces of the cards will be turned toward the floor. As early as possible you take an opportunity of removing the half knave.

SLEIGHT-OF-HAND WITH SIMPLE APPARATUS

A CHEAP WAY OF BEING GENEROUS

YOU take a little common white or bees' wax, and stick it on your thumb. Then, speaking to a bystander, you show him a dime, and tell him you will put the same into his hand; press it down upon the palm of his hand with your waxed thumb, talking to him the while, and looking him in the face. Suddenly take away your thumb, and the coin will adhere to it; then close his hand, and he will be under the impression that he holds the dime, as the sensation caused by the pressing still remains. You may tell him he is at liberty to keep the dime; but on opening his hand to look at it he will find, to his astonishment, that it is gone.

THE FAMOUS MOUNTEBANK TRICK

In the days when merry-andrews and mountebanks met with a hearty welcome on every village green, no conjuring trick was more popular than this; yet there are few that can be performed with less difficulty. You first of all procure a long strip of paper, or several smaller strips pasted together, two or three inches wide. Color the edges red and blue, and roll up the paper like a roll of ribbon. Before doing so, however, securely paste a small piece of cotton at the end you begin to roll. Then, when the proper time has arrived, you take hold of this cotton, and begin to pull out a long roll which very much resembles "a barber's pole." In order to perform this trick with good effect, have before you some paper shavings, which may easily be procured at any bookbinder's, and commence to appear to eat them. The chewed paper can be removed each time a fresh handful is put into the mouth; and when the proper time and opportunity have arrived, put the roll into the mouth, and pull the bit of cotton, when a long roll comes out, as before described, to the astonishment of the audience.

A more elegant but similar feat is the following, which we will style

BRINGING COLORED RIBBONS FROM THE MOUTH

Heap a quantity of finely carded cotton wool upon a plate, which place before you. At the bottom of this lint, and concealed from the company, you should have several narrow strips of colored ribbons, wound tightly into one roll, so as to occupy but little space. Now begin to appear to eat the lint by putting a handful in your mouth. The first handful can easily be removed and returned to the plate unobserved while the second is being "crammed in." In doing this, care should be taken not to use all the lint, but to leave sufficient to conceal the roll. At the last handful, take up the roll and push it into your mouth without any lint; then appear to have had enough, and look in a very distressed state, as if you were full to suffocation; then put your hands up to your mouth, get hold of the end of the ribbon, and draw, hand over hand, yards of ribbon as if from your stomach. The slower this is done, the better the effect. When one ribbon is off the roll your tongue will assist you in pushing an-

other end ready for the hand. You will find you need not wet or damage the ribbons in the least. This is a trick which is frequently performed by one of the cleverest conjurers of the day.

CATCHING MONEY FROM THE AIR

The following trick, which tells wonderfully well when skilfully performed, is a great favorite with one of our best-known conjurers. So far as we are aware, it has not before been published. Have in readiness any number of silver coins, say thirty-four; place all of them in the left hand, with the exception of four, which you must palm into the right hand. Then, obtaining a hat from the audience, you quietly put the left hand with the silver inside; and while playfully asking if it is a new hat, or with some such remark for the purpose of diverting attention, loose the silver, and at the same time take hold of the brim with the left hand, and hold it still so as not to shake the silver. Now address the audience, and inform them that you are going to "catch money from the air." Ask some person to name any number of coins up to ten, say eight. In the same way you go on asking various persons, and adding the numbers aloud till the total number named is nearly thirty; then looking round as though some one had spoken another number, and knowing that you have only thirty-four coins, you must appear to have heard the number called which, with what has already been given, will make thirty-four; say the last number you added made twenty-eight, then, as though you had heard some one say six, "and twenty-eight and six make thirty-four—Thank you, I think we have sufficient." Then, with the four coins palmed in your right hand, make a catch at the air, when they will chink. Look at them, and pretend to throw them into the hat, but instead of doing so palm them again; but, in order to satisfy your audience that you really threw them into the hat, you must, when in the act of palming, hit the brim of the hat with the wrist of the right hand, which will make the coins in the hat chink as if they had just fallen from the right hand. Having repeated this process several times, say, "I suppose we have sufficient," empty them out on to a plate, and let one of the audience count them. It will be found that there are only thirty, but the number which you were to catch was thirty-four. You will therefore say, "Well, we are four short; I must catch just four, neither more nor less." Then, still having four coins palmed in your right hand, you catch again, and open your hands, saying to the audience, "Here they are."

THE DISAPPEARING QUARTER

This is a very mystifying trick, yet one of the simplest to perform. Secure an old-fashioned whiskey glass, a thick one with the outside of the lower half or third heavily chased. The inside of the bottom of the glass should be about the size of a twenty-five cent piece. Go to an optician and get him to cut you a piece of glass of a circumference that will just fit in the bottom of the whiskey glass. Appear before the spectators with a handkerchief thrown over your left sleeve, the whiskey glass in your left hand, and the glass disk concealed in the palm of your right hand. From a pitcher or decanter pour a little water into the glass and set it on the table. Ask one of the company to step forward. Tell him that you wish him to supply you with a quarter, first marking it so that he can identify it. Then take the quarter in your right thumb and finger, holding it up that all may see. Ask the man who supplied the quarter to take the whiskey glass in his left hand.

Holding the quarter in sight of the audience, take the handkerchief with your left hand and place the middle of it over your right thumb and finger. To all appearances you take the quarter up in the middle of the handkerchief, but as a matter of fact you take the glass disk instead, allowing the marked quarter to fall into your palm. Now you hand the handkerchief to the man who has loaned you the quarter, asking him to take it with his right hand and hold it over the whiskey glass. You ask him to hold the quarter by the rim, and he is sure, of course, that he thus holds the coin. Back away ten or fifteen feet, telling him that when you give the word he is to let go of the coin. When sufficiently far from your dupe, exclaim: "One, two, three. Drop it!" He lets go of the "coin," which falls into the glass with a noise that every one in the room hears. Ask him to remove the handkerchief, and he will be amazed to discover that there is no quarter in the glass, though he knows very well that he dropped it there. Next direct him to examine the handkerchief. This performance, of course, throws no light on the mystery of the coin's disappearance. Even if he were to pour the water out of the whiskey glass, the force of suction would keep the glass disk in place at the bottom of the glass.

Suddenly, without having gone near your dupe, hold up the quarter, let every one see it, and then ask your dupe whether he can identify it.

Do not repeat this trick, but proceed immediately to something else. It will be understood, now, why the whiskey glass must be a thick one, in order to conceal the fact, after the trick has been performed, that the glass has really a double bottom.

THE FLYING QUARTER

This is a purely sleight-of-hand trick, but it does not require much practice to be able to do it well and cleverly. Take a quarter between the forefinger and thumb of the right hand; then, by a rapid twist of the fingers, twirl the coin by the same motion that you would use to spin a teetotum. At the same time rapidly close your hand, and the coin will disappear up your coat sleeve. You may now open your hand, and, much to the astonishment of your audience, the coin will not be there. This capital trick may be varied in a hundred ways. One plan is to take three quarters, and concealing one in the palm of your left hand, place one of the others between the thumb and forefinger of the right hand, and the third between the thumb and forefinger of the left hand. Then give the coin in the right hand the twist already described, and closing both hands quickly it will disappear up your sleeve, and the left hand on being unclosed will be found to contain two quarters. Thus you will make the surprised spectators believe that you conjured the coin from your right hand to the left.

PLUMES FOR THE LADIES

The following very clever trick was a favorite with M. Houdin, and was performed by him at St. James's Theatre, where it drew forth a good deal of admiration. When known, however, it appears like a great many other tricks, extremely simple and easy.

Procure two or three large plumes or feathers, or a lot tied together. Take off your coat, and hold one lot in each hand, so that the plumes will lie in a parallel line with the arms. Put your coat on again, and press the feathers into small compass. Ask some one to lend you a large silk handkerchief, throw it over one hand and part of the arm, and with the other quickly draw the feathers from that arm. The plumes, being released from their imprisonment, will spread out and resume their bulky appearance, and the onlookers will be completely baffled as to where they could have come from. Then repeat the process with the other arm.

THE BORROWED QUARTER IN THE WORSTED BALL

This easily performed trick should be in the *repertoire* of every amateur magician. A large ball of worsted is obtained, and a marked quarter having been borrowed from the audience, the worsted is unwound, and out falls the quarter, which but a moment before was supposed to be in the hands of the operator. It is done in this way: Procure a few skeins of thick worsted; next, a piece of tin in the shape of a flat tube, large enough for the coin to pass through, and about four inches long. Then wind the worsted on one end of the tube to a good-sized ball, having a quarter of your own in your right hand. You may now show the trick. Place the worsted anywhere out of sight, borrow a marked quarter, and taking it in your left hand, you put the one in your right hand on the end of the table furthest from the company. While so doing, drop the marked quarter into the tube, pull the tube out, and wind a little more worsted on in order to conceal the hole. Then put the ball into a tumbler, and taking the quarter you left on the table, show it to the company (who will imagine it to be the borrowed quarter), and say "Presto! fly! pass!" Give the end of the ball to one of the audience and request him to unwind it, and on that being done the money will fall out.

THE INK AND FISH TRICK

This trick, originally introduced by M. Houdin, has been performed by every wizard since. A large goblet is placed on the table, containing apparently several pints of ink. A small quantity of ink is taken out with a ladle, and being poured out into a plate, is handed round to the company to satisfy them that it is really ink. A handkerchief is then covered over the goblet, and upon being instantly withdrawn, reveals the glass now full of water, in which swim gold and silver fish. The trick is thus performed: A black silk lining is placed inside the goblet, and kept in its place by a wire ring. It thus forms a bag without a bottom, as it were, and when wet adheres close to the glass in which are the water and the fish. The next part of the deception is the ladle, which must be capable of containing as much ink as will

induce the audience to believe that it was got from the goblet before them. The ink must be concealed in the handle of the ladle, so that when it is lying on the table it will not be perceived; but on being elevated, it must run into the ladle through a small aperture made for the purpose. The black silk is easily withdrawn by the thumb and finger at the time the handkerchief is removed. It must be concealed within the folds of the handkerchief.

SILVER CHANGED TO GOLD—FLYING MONEY

Before commencing this trick you must provide yourself with two quarters and a half eagle, and one of the quarters must be concealed in the right hand. Lay the other quarter and the half eagle on the table, in full view of the audience. Now ask for two handkerchiefs, then take the half eagle up and pretend to roll it in one of the handkerchiefs; but instead of that roll up the quarter, which you had concealed in the right hand, and retain the half eagle. Then give the handkerchief to one of the company to hold. Now take the quarter off the table, and pretend to roll that up in the second handkerchief, but put up the half eagle instead. Give this handkerchief to a second person and bid him "hold it tight," while you command the half eagle and the quarter to change places. On the handkerchiefs being opened, the coins will appear to have obeyed your command.

THE "TWENTY CENTS" TRICK

This trick may be performed with any number of either quarters, half eagles, or half dollars; but, following the traditional rule, we will suppose that you borrow at random twenty cents from the company and display them on a plate, having previously concealed five *other* cents in your left hand. You take the cents from the plate into the right hand, mix them with the concealed five, and then give them to one of the company to hold. You then ask the possessor to return five to you, which he will do, under the supposition that he only retains fifteen, while in reality he retains twenty. You must now have another cent palmed in your right hand, so that when you give the five cents to another person to hold, you add one to the number, and in reality put six into his hands. You then ask him, as in the previous case to return one to you, reminding him, as you receive it, that he has only four left. Then pretending to put the cent you have just received into your left hand, you strike the left hand with your magic wand, and bid the coin you are supposed to be holding to fly into the closed hand of the person holding five, or, as he supposes, four cents. On unclosing his hand he will find it to contain five cents, and he will believe that you transferred one of them thither. Now, taking the five cents, you must dexterously pass them into the left hand, and bid them fly into the closed hand of the person holding the supposed fifteen; and he, in like manner, will be astonished to find, on unclosing his hand, that it contains twenty cents instead of, as he supposed, fifteen.

THE MYSTERIOUS BAG

Mr. Philippe, when appearing before his wonder-struck audiences, used to excite the most profound amazement by means of a mysterious bag, from which he produced nearly every conceivable thing, from a mouse-trap to a four-post bedstead; and its capacity was so prodigious, that it swallowed even more than it produced. Similar but less pretentious is the one which we give under the title of "The Mysterious Bag." Make two bags, each about a foot long and six inches wide, of some dark material, and sew them together at the edge, so that one may be inside the other. Next make a number of pockets, each with a cover to it, which may be fastened down by a slight elastic band. Place these about two inches apart, between the two bags, sewing one side of the pocket to one bag and the other side to the other. Make slits through both bags about an inch long, just above the pockets, so that you can put your hand in the bags; and by inserting your thumb and finger through these slits you may obtain entrance to the pockets, and bring out of them whatever they contain. It is, of course, necessary that a variety of articles should be put in the pockets. Before commencing the trick you may turn the bag inside out any number of times, so that your audience may conclude that it is quite empty. You can then cause to appear or disappear any number of articles of a light nature, much to the amusement of your audience.

TO MAKE A DIME DISAPPEAR AT COMMAND

This simple and well-known but often amusing trick enables the operator to cause a small coin to disappear after it has been wrapped up in a handkerchief. Borrow a dime or a small coin, or use one of your

own, and secretly place a small piece of soft wax on one side of it; then spread a pocket-handkerchief on a table, and taking up a coin, show it to your audience, being very careful not to expose the side that has the wax on it. Having done this, place the coin in the centre of the handkerchief, so that the wax side will adhere. Then bring the corner of the handkerchief over, and completely hide the coin from the view of the spectators. All this must be carefully done, or the company will perceive the wax on the back of the coin. You must now press very hard on the coin with your thumb, in order to make it adhere. When you have done this, fold over successively the other corners, repeating the operation a second time, and leaving the fourth corner open. Then take hold of the handkerchief with both hands at the open part, and sliding your finger along the edge of the same, it will become unfolded, and the coin adhering to the corner of the handkerchief will, of course, come into your right hand; then detach the coin, shake out the handkerchief, and to the great astonishment of the company the coin will have disappeared.

In order to convince your audience that the coin is still in the handkerchief after you have wrapped it up, you can drop it on the table, when it will sound.

THE TWO KINGS

This trick produces both merriment and mystification. It is to be performed while a friendly party is seated around a table. If you are fortunate enough to be a married man your wife may serve as your confederate; otherwise any one of your friends whom you have trained sufficiently well will answer. Run through the pack of cards, selecting the king of spades and the king of clubs, explaining that you do this because they are both black, and that this fact will save confusion. Now, after shuffling the remaining cards of the pack, divide them into two approximately even packs, placing each face down on the table. Throw also the two black kings face down. Now, rising, say: "I am going to take one of these packs in my left hand [suiting the action to the word], and in my right hand I will take one of the kings, which, as you will see, is the king of spades. Pardon me for turning my back, I wish to shuffle the king of spades [if that happens to be the one of the two] most thoroughly into this pack." Turn your back and shuffle, taking plenty of time about it. While your back is turned your confederate, with a sly wink at your audience, takes the top card off the remaining pack and places it on the table, in the same place where you have left the inverted king of clubs lying, placing the king of clubs on top of the inverted pack. When you have finished shuffling and turn back you will probably see a good deal of poorly suppressed merriment on the faces of your audience. Pretend not to see this, but, laying down the pack that you have just shuffled, pick up the other pack in the left hand, and in the right the card that has been substituted by your confederate for the king of clubs. Seating yourself at the table, pick up that substituted card, saying to the spectators: "I have in my right hand, as you will see, the king of clubs." Of course they will see that you have nothing of the sort, and probably some one will break out into uncontrollable merriment at thought of the "sell" that is being played upon you. If this should happen, merely say: "Oh, don't worry. I have performed this feat hundreds of times, and have never yet failed in it." This is likely to produce a general roar of laughter, your confederate being the only one who seems able to keep a straight, demure face. If you are laughed at by all hands, pretend to be annoyed at their want of confidence in your skill, and say, hurriedly, again holding up the substituted card: "This *king of clubs* [more laughter from your audience] I am going to place in the middle of the second pack." Do so, and, retaining that second pack in your hand, face down, seat yourself behind the table, pick up the first pack, containing the king of spades, and place that face down, on top of the other pack, keeping the two packs separate by the sly insertion of your little finger between them. The end of the combined pack that shows through your hand to the audience will appear to be closed, and no one will detect the fact that at the other end the two packs are separated by your little finger. Now begin dealing off the top of the first pack, saying: "The first black king that I bring up will be, of course, the king of spades. Wonderful as it may seem, the very next card to it will be the king of clubs." [More giggles from some of the spectators, who realize how nicely you are being fooled.] Turning the cards off, quite slowly, and one at a time, laying them face upward, you finally turn up the king of spades. "Ah, here is the king of spades," you exclaim, "and the next card, of course, will be the king of clubs." At the same time you carelessly flip up the corner of the next card, allowing those opposite to you to see that the next card is *not* the

king of clubs. There will be renewed merriment, at which you look intensely astonished, and somewhat indignant, also remarking, protestingly: "But I *know* that the next card is the king of clubs. I tell you I have never failed in this trick yet." Some one in the party will want to make a wager that the next card turned up will not be the king of clubs. Calmly accept the wager, and as many more as are offered. While talking, let your two hands fall carelessly below the edge of the table for an instant, still looking into the eyes of your tormentors. Instantly "slip" the packs separated by your little finger, and change their positions, so that the lower pack, with the king of clubs uppermost, will now be on top. Raise your left hand above the table again, taking pains to do it in such a manner as not to arouse suspicion. As soon as the fun and wagers are over with, lay the pack on the table, face down as before, and say: "Will some one else kindly take off the next card and show the company what it is?" Some one will turn the card amid roars of laughter, which will suddenly change to looks of amazement, when it is discovered that the next card really is the king of clubs. It will speedily dawn upon all that your confederate has duped them, and the confederate will probably have to beat a hasty, laughing retreat. Of course, you can not honorably collect the wagers.

THE TRAVERSING RING

Provide yourself with a silk handkerchief and a small ring. With a needleful of silk, doubled, sew the ring to the middle of the handkerchief, but let it be suspended by the silk within an inch or two of the bottom of the handkerchief. When the handkerchief is held up by the two corners, the ring must always hang on the side facing the conjurer. The handkerchief may now be crumpled up to "show all fair." Obtain a ring from one of the company, and retain it in the hand with which you receive it, but pretend to pass it to the other. Then pretend to wrap it up in the handkerchief, and taking hold of the other ring through the folds, request some one to hold it. Ask them if they can feel it, and as soon as they are satisfied that this is the identical ring which you borrowed, you put a plate on the table, and request the person holding the handkerchief to place both it and the ring on the plate. You then inform the company that you will cause the ring to pass through the plate and table into a little box, which you show round, and which you will place under the table. You can easily slip the ring in as you are doing so. Then partly unwrap the handkerchief, so that the ring will chink upon the plate, and with the words, "Quick! change! begone!" or some expression of similar import, take the handkerchief by two corners, and put it in your pocket, saying, "It is now in the box." You then request some one to pick it up and take out the ring.

THE COOKING HAT

Have cakes or pudding previously made, and procure a jar or doctor's gallipot, and a tin pot, made straight all the way up, with the bottom half way down, so that both ends contain exactly the same quantity. The ready-made pancakes are previously put into the one end of this pot, which must be dexterously slipped into the hat. Then take some milk, flour, eggs, etc., and mix them up in the jar. Having done so, deliberately pour the mixture into the hat, taking care that the pot previously deposited there receives it. Put the jar down into the hat, press it on the tin pot, which exactly fits inside the jar, and brings away the pot containing the mixture, leaving the pancakes, which you pretend to fry over the candle, using the hat as a frying-pan. Then turn out the pudding or pancakes, show that the hat remains unsoiled, and restore it to its owner.

AN AVIARY IN A HAT

This excellent but well-known trick requires the assistance of a confederate. A hat is borrowed as before from one of the audience, and turned round and round to show there is nothing in it. It is then laid on the operator's table, behind a vase or some other bulky article; after which, as if a new idea had occurred to you, perform some other trick, during which the confederate removes the borrowed hat, substituting one previously prepared. This substituted hat is filled with small pigeons, placed in a bag with a whalebone or an elastic mouth, which fits the inside of the hat. The bag containing the birds is covered with a piece of cloth, with a slit in the top. The operator, taking up the hat, puts his hands through the slit, and takes out the birds one by one, till all are free. The hat is then placed on the table, for the ostensible purpose of cleaning it before handing it back, and the confederate again changes the hats, having in the interim fitted the borrowed hat with a bag similar to the other, and also filled with pigeons. This having

been done, you call out to your confederate, and request him, so that all your audience may hear, to "Take the gentleman's hat away, and clean it." He takes it up, and peeps into it, saying, "You have not let all the birds away," upon which, to the surprise and amusement of the spectators, you produce another lot of birds as before. In brushing the hat previous to restoring it to the owner, the bag may be adroitly removed.

A BANK-NOTE CONCEALED IN A CANDLE

Ask some one to lend you a bank-note, and to notice the number, etc. You then walk up to the screen behind which your confederate is concealed, pass the note to him, and take a wax or composite candle. Then turning to the audience, you ask one of them—a boy would be preferred—to step up on the platform. At your request he must cut the candle into four equal parts. You then take three of them, and say you will perform the trick by means of them, passing the fourth piece to the other end of the table, where your confederate has already rolled up the note in a very small compass, and thrust it into a hollow bit of candle, previously made ready. You take up this piece, and, concealing it in your hand, you walk up to the boy, and appear accidentally to knock one of the bits of candle out of his hand, and while you are stooping to pick it up off the floor, you change it for the bit which contains the note. You then place it on the table, and say to the audience, "Which piece shall I take—right or left?" If they select the one which contains the note, ask the boy to cut it carefully through the middle, and to mind that he does not cut the note. When he has made a slight incision, tell him to break it, when the note will be found in the middle. If the audience select the piece which does not contain the note, you throw it aside, and say that the note will be found in the remaining piece. When this is done with tact, the audience will naturally believe that they have really had the privilege of choosing.

THE DOLL TRICK

The Doll Trick, although common in England and at every fair throughout the United States, is without exception one of the best sleight-of-hand tricks that was ever performed, and must not be omitted here.

The conjurer produces a wooden painted doll, about six inches long; he then places it in a bag of very dark material, and tells his story. "The little traveler, ladies and gentlemen, you see before you is a wonderful little man who has been all over the world; but as he has grown older he has become very nervous. One evening lately, at a small *cabaret* in the south of France, he was stating how nervous he was and how much he dreaded being robbed, when a Jew who sat in a corner of the room undertook to impart to him the means of making himself invisible at any moment, for a sum to be agreed upon. The bargain was struck, the money paid, and the Jew placed at his disposal a small skull-cap, which, as soon as it was placed upon his head, rendered him at once invisible; and I will now show you, ladies and gentlemen, the power possessed by this cap." The doll is then introduced into the bag, which has a small opening at the smaller end sufficiently large to admit of the doll's head passing through it. When the head has been shown, the lower part of the bag is turned over the doll and its body shown, "so that there can be no deception!" The conjurer then says (still holding the head above the top of the bag), "I will now show you the wonderful cap by which the old gentleman is at once rendered invisible;" and producing it from his pocket, he places it upon the head of the doll for a moment, and then removes it; the head then disappears in the bag, which is then turned inside out, and no trace of the doll can be perceived, though the bag be thrown on the floor, stamped upon, etc.

And now for the secret and the method of performing this really surprising though very simple trick. The head is removable and only fastened to the neck by a peg about three-quarters of an inch long; the bag or dress is made full at the bottom, *i.e.*, about the size of a hat, and has an opening at the top just large enough to allow the doll's head to pass through it; at the lower edge of this bag must be made a small pocket, just large enough to contain *easily* the doll, and on the outside of the bag must be a red streak, by way of ornament, coming from the top directly down to the pocket, so that it may be seen exactly where the pocket is. This side of the bag must be held nearest to the performer.

In performing the trick the doll is introduced at the bottom of the bag, and passed upward until the head is shown through the opening at the top; and when the performer says, "I will now show you the cap," he, holding the head of the doll in his left hand, quickly passes the body into his pocket, where he has the cap, which he produces, leaving the body in its place.

He then for a moment places the cap on the doll's head, and replaces it in his pocket; then placing his right hand in the bag, he slowly draws down the head, which he slips into the small pocket in the bag, and shows his hand open and empty. He then catches hold of the lower edge of the bag at the pocket, holding, of course, the head of the doll in his hand, and strikes the bag against the table, ground, etc., and says, "I told you the old gentleman would become invisible." He then says, "I will try to bring him back again;" and introducing his hand into the bag, he takes the head from the pocket and shows it through the opening at the top of the bag, and retaining it in his hand, he throws the bag on the floor and tramples upon it.

If well done, we consider this trick, though common, one of the best that is performed. It will be as well to have two dolls made exactly alike, one with the head fixed, to be handed round, and the other with the movable head to be used in the trick. We sometimes use a pocketless dress, and "palm" the head.

TO PASS A DIME THROUGH A TABLE

This trick, like the preceding one, is very amusing, and if well, and what we may call *cleanly*, done, is really very astonishing. The conjurer, seating himself at a table, borrows two articles of any kind sufficiently small to be concealed in the hands; these he places on the edge of the table before him, and says, "I take this one, as you see, in my right hand, and hold it at arm's length, and the other I take in my left hand—my hands never meet. I now place my left hand under the table and my right hand above it, and upon my giving the word 'Pass!' the dime which you saw me take in my right hand will pass through the table to the ball of cotton in my left, which you see is the case."

This trick is very easy of accomplishment, if but a little time and patience be bestowed upon it. The dime, piece of India-rubber, or any other small article must be placed on the edge of the table, and the fingers must be placed over it *exactly* the same way as if it were really desired to take it in the hand; but instead of doing so the fingers merely push it over the edge of the table, and, the knees of the performer being closed, it falls into his lap. It is then picked up with the left hand, and the right hand being brought sharply upon the upper surface of the table, the dime appears to have passed through it.

THE CUP AND CENT

This too, if well performed, is a most astounding trick. Three coins of one cent each are shown, and a small cap or cup. The cents are thrown on the table, picked up again, arranged one on the other, and the cap placed over them. A hat is then introduced, and shown to be empty; this is then held in the left hand under the table, the cap removed with the right hand, the cents shown and recovered. The conjurer then says, "Pass!", when the cents are heard to fall in the hat; the cap on the table is raised, and they are gone, and in their place a small die or three-cent piece appears. The cents are then taken in the left hand, held under the table, and commanded to pass; and on raising the cap they again appear beneath it.

This trick is very simple though ingenious, and the solution of it is as follows. The cap is of leather or any similar stiff material, and made to fit over three coins of one cent each *easily;* and the "trick" cents are six riveted together, the upper one being entire, but the other five being turned out, leaving nothing but their outer rims. Three coins of one cent each are shown, as also the cap; and after showing the cents, while gathering them in the hand, "palm" them and place the "trick" cents (inside of which is the die) on the table, and cover them with the cap. Then taking the hat in the left hand, command the cents to pass, and at the word drop the genuine cents into the hat, at the same time raising the cap on the table, and by pinching the sides of it rather tightly the "trick" cents are raised with it, and the die or three cent-piece appears then covering the die or three cent-pieces with the cap and the "trick" cents concealed in it, show the genuine cents in the hat, and command them to return; and holding the genuine cents in the left hand, lift the cap, and the cents again appear. Then taking the cap in the right hand, adroitly drop the "trick" cents into it and tender the cap for scrutiny.

The tablecloth should be a thick and soft one, to prevent the spectators from hearing the die fall as the "trick" cents are placed on the table.

THE SHOWER OF SUGARPLUMS

This is a capital *finale* to an evening's amusement, particularly with young children. A small bag, capable of holding about a pint, must be made of a piece of figured calico, of a conical shape, but open at the bottom or larger end, on each side

of which must be inserted a flat thin piece of whalebone; at the upper or smaller end must be a small hook made of wire—a lady's hairpin will answer the purpose perfectly. The trick is performed in this way:

The bottom of the bag must be opened by pressing the opposite ends of the two pieces of whalebone, when, of course, they will bend and divide, and the bag must then be filled with sugarplums, care being taken to put the small bonbons at the top of the bag, and the large ones at the bottom next the whalebone, which will prevent the small ones from falling out. The bag when filled must on the first opportunity be suspended by its hook at the back of a chair having a stuffed back, so that it can not be seen.

When the trick is to be performed, a large handkerchief must be shown, with a request that it may be examined. It is then laid over the back of the chair. A little girl must then be asked if she is afraid of being out in the rain, and on her answering in the negative she must be requested to kneel down in the middle of the room. The performer must then place his left hand on the handkerchief, and feeling the hook which supports the bag, he raises it with the handkerchief, and holds it above the little girl's head; then passing his right hand from the fourth finger and thumb of the left hand which hold the handkerchief and bag, downward, he can easily feel the bottom of the bag, and on pressing the opposite ends of the whalebone, they bend and open, and the contents of the bag of course fall out in a shower, and a general scramble among the children takes place.

THE VANISHING DIME

Take a sheet of absolutely fresh Manila paper that has not been creased or punctured. The size of this sheet should be at least 12 by 18 inches, and the paper should be rather heavy. Next take a goblet of cylindrical shape. Cut a piece of the same kind of Manila paper into a square a little larger than the mouth of the glass. Delicately apply a very little mucilage all around the rim of the glass, taking care not to let any of it get on the sides. Now press the mouth of the glass firmly against the small square of paper, causing the paper to adhere to the rim of the glass. After a minute take a sharp-pointed penknife and trim the paper closely around the rim until the paper that adheres to the mouth of the glass just covers the mouth, with no projecting edges or points. Take another piece of Manila paper and fold it into a long cylinder that will just fit over the inverted glass. Close the top of this paper cylinder by folding it over. Place the large sheet of Manila paper on the table. On one edge of the sheet of paper place the glass, inverted, and no one, looking through the glass, will detect the fact that there is a thickness of paper glued to the mouth of the glass. Borrow a dime from one of the company. Place this upon the sheet of Manila paper, and next hand the paper cylinder to the spectators to inspect. Taking back the cylinder, place it over the glass. Now, lifting glass and cylinder together, place the glass over the dime. Call attention to the fact that in so doing you are not touching the dime, which, as every one will know, must now be under the glass. Lift the cylinder from over the glass, and the spectators, looking through the glass, will be puzzled at observing that the dime no longer appears to be there. Almost immediately replace the cylinder over the glass, lifting both, and the dime is there where the spectators last saw it. Of course, while the glass is over the dime, the paper glued to the mouth of the glass prevents its being seen.

Repeat this trick two or three times quickly, and then remove the apparatus, proceeding to some other trick. It goes without saying that the performer must not allow any one to lift the glass to examine it, or the trick will be at once comprehended. Preventing curious spectators from examining parts of your apparatus that you do not wish them to see is one of the arts of a sleight-of-hand performer, and is born of tact.

THE PENKNIFE AND QUARTER TRICK

This is a most ingenious trick, and is done in this way. Mounting a table, stick the penknife by its point into the ceiling, but only sufficiently to support it. Then after a deal of examination of its position, etc., place a piece of brown paper on the floor, on which put the quarter, and then say you will undertake to place the quarter so exactly under it that, when dislodged, the knife shall fall upon it. When wonder is excited, and it is declared to be impossible, call for a glass of water; then mounting on the table, dip the penknife in the water and withdraw the glass; a drop of water will soon fall on the paper, and on that very spot place the quarter. You then strike the ceiling with your fist, when the

knife will fall, of course, on the quarter. The knife chosen for the purpose should be one having rather a heavy pointed handle, as the drop of water will then fall from the most central point.

TO PRODUCE A CANNON-BALL FROM A HAT

A ball must be turned out of any kind of soft light wood, and must have a hole bored in it large enough to admit the middle finger, and it should be painted black. The trick is performed in this way: On the front of the conjuring table, *i.e.*, the side next the spectators, should be placed a few layers of books, high enough to conceal from view the ball or any other apparatus with which it is intended to perform. On the side of the books next the performer the ball should be placed, with the hole in it toward him. The hat should be placed on the books on its side on the left-hand end of the table, with its crown next the spectators. When the trick is to be performed the hat should be shown to be entirely empty, and then returned to its position on the books; then, having placed a hat-brush or silk handkerchief at the right hand of the table, say, "This trick can not be performed unless the hat is perfectly smooth," and while leaning to the right to reach the brush or handkerchief, which diverts attention to *that* end of the table, the middle finger of the left hand must be placed in the hole in the ball, which is thus slipped into the hat, which must then be carefully brushed and held crown uppermost. The brush should then be put down, and the right thumb placed on the rim of the hat, with the fingers extended underneath so as to support the ball in the hat, and the left hand should then be placed in the same position, and the hat, with the ball in it, carried and placed upon another table. A small ball must then be produced, and a boy asked if he thinks he can hold it in his mouth, and told to try. The ball is then taken in the right hand, pretended to be thrown against the hat, "palmed," and concealed in the pocket. The boy should then be asked if he will again take the ball in his mouth, and while opening it the cannon-ball is suddenly taken from under the hat and placed in front of his face.



ETIQUETTE may be defined as the minor morality of life. Its laws, like all other social laws, are the accumulated results of the wisdom and experience of many generations. They form a code with which every educated person is bound to be acquainted. The word, *etiquette,* is from the French, and means, in brief, a ceremonial, also something that is "labeled," or designated. Properly understood, it is as necessary to the well-being of people as are the greater questions of behavior, commonly included under the head of morality. If a man does an immoral thing—something that injures both himself and others—he is very properly avoided by all who know of it. Similarly, if he pays no heed to the minor amenities of life, if he ignores the rules of custom that indicate what is due to others in the way of treatment, respect, and consideration, he is justly considered uncouth and boorish. To be sure, customs differ among the various nations, and what is considered perfectly polite in one country is the essence of rudeness in another. Thus, in Japan, it is said, that in visiting a man at his house, it is considered a breach of all laws to take any notice whatever of his wife or other female relatives—unless the host sees fit to present them. Such foreign customs need not be considered until one goes abroad. "While we are in Rome we behave as the Romans do," and, if we wish to stand well with our fellows, we must know "what is done."

GENERAL PRINCIPLES OF ETIQUETTE

INTRODUCTIONS

TO introduce persons who are mutually unknown is to undertake a serious responsibility, and to certify to each the respectability of the other. Never undertake this responsibility without, in the first place, asking yourself whether the persons are likely to be agreeable to each other; nor, in the second place, without ascertaining whether it will be acceptable to both parties to become acquainted.

Always introduce the gentleman to the lady—never the lady to the gentleman. The chivalry of etiquette assumes that the lady is invariably the superior in right of her sex, and that the gentleman is honored in the introduction.

Never present a gentleman to a lady without first asking her permission to do so.

When you are introduced to a gentleman, never offer your hand. When introduced, persons limit their recognition of each other to a bow.

Persons who have met at the house of a mutual friend without being introduced should not bow if they afterward meet else-

where. A bow implies acquaintance; and persons who have not been introduced are not formally acquainted. This rule is only general, however, and people may act as they feel inclined.

If you are walking with one friend, and presently meet with, or are joined by, a second, do not commit the too frequent error of there and then introducing them to each other.

In your own house you have the right to introduce two visitors, who may be strangers, at your own discretion, whether they care to continue the acquaintance or not. If you consider such persons qualified to be equally your friends you are justified in so doing. A good rule, however, is not to bring people together deliberately who would certainly be uncongenial.

There are some exceptions to the etiquette of introduction. At a ball, or evening party where there is dancing, the mistress of the house may introduce any gentleman to any lady without first asking the lady's permission. But she should first ascertain whether the lady is willing to dance; and this out of consideration for the gentleman, who may otherwise be refused. No man likes to be refused the hand of a lady, though it be only for a quadrille.

A sister may present her brother, or a mother her son, without any kind of preliminary.

Friends may introduce friends at the house of a mutual acquaintance; but, as a rule, it is better to be introduced by the mistress of the house. Such an introduction carries more authority with it.

Introductions at evening parties are now almost wholly dispensed with. Persons who meet at a friend's house are ostensibly upon an equality, and pay a bad compliment to the host by appearing suspicious and formal. Some old-fashioned country hosts still persevere in introducing each new-comer to all the assembled guests. It is a custom that can not be too soon abolished, and one that places the last unfortunate visitor in a singularly awkward position. All that she can do is to make a semicircular courtesy, like a concert singer before an audience, and bear the general gaze with as much composure as possible.

An introduction given at a ball for the mere purpose of conducting a lady through a dance does not give the gentleman any right to bow to her on a future occasion. If he commits this error, she may remember that she is not bound to see, or return, his salutation.

LETTERS OF INTRODUCTION

Do not lightly give or promise letters of introduction. Always remember that when you give a letter of introduction you lay yourself under an obligation to the friend to whom it is addressed. Always ask yourself whether the person introduced will be an acceptable acquaintance to the friend addressed in your letter. If the stranger is in any way unsuitable in habits or temperament, you inflict an annoyance on your friend instead of a pleasure. In questions of introduction never oblige one friend to the discomfort of another.

Those to whom letters of introduction have been given should send them to the person to whom they are addressed, and inclose a card. Avoid delivering a letter of introduction in person. It places you in the most undignified position imaginable, and compels you to wait while it is being read, like a servant who has been told to wait for an answer.

If, on the other hand, a stranger sends you a letter of introduction and her card, you are bound by the laws of politeness and hospitality, not only to call at the earliest opportunity, but to follow up that attention with others, as may seem suitable.

A letter of introduction should be given unsealed, not alone because your friend may wish to know what you have said of him or her, but also as a guarantee of your own good faith. As you should never give such a letter unless you can speak highly of the bearer, this rule of etiquette is easy to observe. By requesting your friend to fasten the envelope before forwarding the letter to its destination, you tacitly give permission to inspect its contents.

VISITING, MORNING CALLS, CARDS

A "morning" visit should be paid between the hours of 2 and 4 P.M. in winter, and 2 and 5 in summer.

Visits of ceremony should be short. Even if the conversation should become animated, beware of letting your call exceed half an hour's length. It is always better to let your friends regret rather than desire your withdrawal.

On returning visits of ceremony you may, without impoliteness, leave your card at the door without going in. Do not fail, however, to inquire if the family be well.

Should there be daughters or sisters residing with the lady upon whom you make a first call, or a call after an entertainment at the house, a card is left for each, and at departure a card for the host.

Under other conditions cards are no longer left for each member of the family. A married woman making the first call of the season leaves her husband's card and her own; thereafter she leaves two of her husband's.

Unless when returning thanks for "kind inquiries," or announcing your arrival in, or departure from, town, it is not considered respectful to send round cards by a servant.

Leave-taking cards have P. P. C. (*pour prendre congé*) written in the corner. Some use P. D. A. (*pour dire adieu*).

The visiting cards of gentlemen are half the size of those used by ladies.

Autographic facsimiles for visiting cards are affectations in any persons but those who are personally remarkable for talent, and whose autographs, or facsimiles of them, would be prized as curiosities.

Visits of condolence are paid within the week after the event which occasions them. Personal visits of this kind are made by relations and very intimate friends only. Acquaintances should leave cards with narrow mourning borders.

On the first occasion when you are received by the family after the death of one of its members, it is etiquette to wear slight mourning.

When a gentleman makes a morning call, he should never leave his hat or riding-whip in the hall, but should take both into the room. To do otherwise would be to make himself too much at home. The hat, however, must never be laid on a table, piano, or any article of furniture; it should be held gracefully in the hand. If you are compelled to lay it aside put it on the floor.

Umbrellas should invariably be left in the hall.

Never take favorite dogs into a drawing-room when you make a morning call. Their feet may be dusty, or they may bark at the sight of strangers, or, being of too friendly a disposition, may take the liberty of lying on a lady's gown, or jumping on the sofas and easy-chairs. Where your friend has a favorite cat already established before the fire, a battle may ensue, and one or both of the pets be seriously hurt. Besides, many persons have a constitutional antipathy to dogs, and others never allow their own to be seen in the sitting-rooms. For all or any of these reasons a visitor has no right to inflict upon his friend the society of his dog as well as of himself.

Neither is it well for a mother to take young children with her when she pays morning visits; their presence, unless they are unusually well trained, can only be productive of anxiety to both yourself and your hostess. She, while striving to amuse them, or to appear interested in them, is secretly anxious for the fate of her album, or the ornaments on her *étagère;* while the mother is trembling lest her children should say or do something objectionable.

If, when you call upon a lady, you meet a lady visitor in her drawing-room, you should rise when that lady takes her leave.

If other visitors are announced, and you have already remained as long as courtesy requires, wait till they are seated, and then rise from your chair, take leave of your hostess, and bow politely to the newly arrived guests. You will, perhaps, be urged to remain, but, having once risen, it is always best to go. There is always a certain air of *gaucherie* in resuming your seat and repeating the ceremony of leave-taking.

If you have occasion to look at your watch during a call, ask permission to do so, and apologize for it on the plea of other appointments.

In receiving morning visitors, it is not necessary that a lady should lay aside the employment in which she may be engaged, particularly if it consists of light or ornamental needlework. Politeness, however, requires that music, drawing, or any occupation which would completely engross the attention, be at once abandoned.

You need not advance to receive visitors when announced, unless they are persons to whom you are desirous of testifying particular attention. It is sufficient if a lady rises to receive her visitors, moves forward a single step to shake hands with them, and remains standing till they are seated.

When your visitors rise to take leave you should rise also, and remain standing till they have quite left the room.

A lady should dress well, but not too richly, when she pays a morning visit.

CONVERSATION

Let your conversation be adapted as skilfully as may be to your company. Some men make a point of talking commonplaces to all ladies alike, as if a woman could only be a trifler. Others, on the contrary, seem to forget in what respects the education of a lady differs from that of a gentleman, and commit the opposite error of conversing on topics with which ladies are seldom acquainted. A woman of sense has as much right to be annoyed by the one, as a lady of ordinary education by the

other. You can not pay a finer compliment to a woman of refinement and *esprit* than by leading the conversation into such a channel as may mark your appreciation of her superior attainments.

In talking with persons of ordinary education, avoid political, scientific, or commercial topics, and choose only such subjects as are likely to be of interest to them.

Do not use a classical quotation in the presence of ladies without apologizing for or translating it. Even this should only be done when no other phrase would so aptly express your meaning. Whether in the presence of ladies or gentlemen, much display of learning is pedantic and out of place.

There is a certain distinct but subdued tone of voice which is peculiar to only well-bred persons. A loud voice is both disagreeable and vulgar. It is better to err by the use of too low rather than too loud a tone.

Remember that all "slang" is vulgar.

Do not pun. Puns, unless they rise to the rank of witticisms, are to be scrupulously avoided.

Long arguments in general company, however entertaining to the disputants, are tiresome to the last degree to all others. You should always endeavor to prevent the conversation from dwelling too long upon one topic.

Religion is a topic which should never be introduced in society. It is the one subject on which persons are most likely to differ and least able to preserve temper.

Never interrupt a person who is speaking.

It is considered extremely ill-bred when two persons whisper in society, or converse in a language with which all present are not familiar. If you have private matters to discuss, you should appoint a proper time and place to do so, without paying others the ill compliment of excluding them from your conversation.

If a foreigner be one of the guests at a small party, and does not understand English sufficiently to follow what is said, good-breeding demands that the conversation shall be carried on in his own language. If at a dinner-party, the same rule applies to those at his end of the table.

If upon the entrance of a visitor you carry on the thread of a previous conversation, you should briefly recapitulate to him what has been said before he arrived.

Always look, but never stare, at those with whom you converse.

In order to meet the general needs of conversation in society, it is necessary that a man should be well acquainted with the current news and historical events of at least the last few years.

Never talk upon subjects of which you know nothing, unless it be for the purpose of acquiring information. Many young men imagine that because they frequent exhibitions and operas they are qualified judges of art. No mistake is more egregious or universal.

Those who introduce anecdotes into their conversation are warned that these should invariably be "short, witty, eloquent, new, and not far-fetched."

Scandal is the least excusable of all conversational vulgarities.

In order to talk well three conditions are indispensable, namely, tact, a good memory, and a fair education.

Remember that people take more interest in their own affairs than in anything else which you can name. If you wish your conversation to be thoroughly agreeable, lead a mother to talk of her children, a young lady of her last ball, an author of his forthcoming book; or an artist of his exhibition picture. Having furnished the topic, you need only listen; and you are sure to be thought not only agreeable, but thoroughly sensible and well-informed.

Be careful, however, on the other hand, not always to make a point of talking to persons upon general matters relating to their profession. To show an interest in their immediate concerns is flattering; but to converse with them too much about their own art looks as if you thought them ignorant of other topics.

To listen well is almost as great an art as to talk well. It is not enough *only* to listen. You must endeavor to seem interested in the conversation of others.

Do not be *always* witty, even though you should be so happily gifted as to need the caution. To outshine others on every occasion is the surest road to unpopularity.

ON THE STREET

A well-bred man must entertain no respect for the brim of his hat. "A bow," says La Fontaine, "is a note drawn at sight." You are bound to acknowledge it immediately, and to the full amount. True politeness demands that the hat should be quite lifted from the head.

On meeting friends with whom you are likely to shake hands remove your hat with the left hand in order to leave the right hand free.

If you meet a lady in the street whom you are sufficiently intimate to address, do not stop her, but turn round and walk beside her in whichever direction she is going. When you have said all that you wish to say, you can take your leave.

If you meet a lady with whom you are not particularly well acquainted, wait for her recognition before you venture to bow to her.

In bowing to a lady whom you are not going to address, lift your hat with that hand which is furthest from her. For instance, if you pass her on the right side, use your left hand; if on the left, use your right.

If you are on horseback and wish to converse with a lady who is on foot, you must dismount and lead your horse, so as not to give her the fatigue of looking up to your level. Neither should you subject her to the impropriety of carrying on a conversation in a tone necessarily louder than is sanctioned in public by the laws of good breeding.

When you meet friends or acquaintances in the streets, at the exhibitions, or any public places, take care not to pronounce their names so loudly as to attract the attention of the passers-by. Never call across the street; and never carry on a dialogue in a public vehicle unless your interlocutor occupies the seat beside your own.

In walking with a lady, take charge of any small parcel, parasol, or book with which she may be encumbered.

RIDING AND DRIVING

In riding, as in walking, give the lady the wall.

If you assist a lady to mount, hold your hand at a convenient distance from the ground that she may place her foot in it. As she springs, you aid her by the impetus of your hand. In doing this, it is always better to agree upon a signal, that her spring and your assistance may come at the same moment.

For this purpose there is no better form than the old dueling one of "one, two, *three*."

When the lady is in the saddle, it is your place to find the stirrup for her, and guide her left foot to it. When this is done, she rises in her seat and you assist her to draw her habit straight.

Even when a groom is present, it is more polite for the gentleman himself to perform this office for his fair companion; as it would be more polite for him to hand her a chair than to have it handed by a servant.

If the lady be light, you must take care not to give her too much impetus in mounting. We have known a lady nearly thrown over her horse by a misplaced zeal of this kind.

If a gate has to be opened, we need hardly observe that it is your place to hold it open till the lady has passed through.

In driving, a gentleman places himself with his back to the horses, and leaves the best seat for the ladies.

When the carriage stops, the gentleman should alight first, in order to assist the lady.

To get in and out of a carriage gracefully is a simple but important accomplishment. If there is but one step, and you are going to take your seat facing the horses, put your left foot on the step, and enter the carriage with your right in such a manner as to drop at once into your seat. If you are about to sit with your back to the horses, reverse the process. As you step into the carriage, be careful to keep your back toward the seat you are about to occupy, so as to avoid the awkwardness of turning when you are once in.

A gentleman can not be too careful to avoid stepping on ladies' dresses when he gets in or out of a carriage. He should also beware of shutting them in with the door.

DRESS FOR WOMEN

To dress well requires taste, good sense, and refinement. It may almost be classed as one of the fine arts, and is certainly one of those arts the cultivation of which is indispensable to any person moving in society. Very clever women are too frequently indifferent to the graces of the toilette; and women who wish to be thought clever affect indifference. In the one case it is an error, and in the other a folly. It is not enough that a woman should be clever, or well-educated, or well-born. To take her due place in society, she must know how to enter a room, how to perform a graceful salutation, and how to dress. Of these three important qualifications, the most important, because the most observed, is the latter.

Let your style of dress always be appropriate to the hour of the day. To dress too finely in the morning, or to be seen in a morning dress in the evening, are equally vulgar and out of place.

Light and inexpensive materials are fittest

for morning wear; dark silk dresses for the promenade or carriage; and low dresses of rich or transparent stuffs for the dinner and ball. A young lady can not dress with too much simplicity in the early part of the day. A morning dress of some simple material, and delicate whole color, with collar and cuffs of spotless linen, is, perhaps, the most becoming and elegant of morning toilettes.

Never dress very richly or showily in the street. It attracts attention of no enviable kind, and is looked upon as a want of good breeding. In the carriage a lady may dress as elegantly as she pleases. With respect to ballroom toilettes, its fashions are so variable, that statements which are true of it to-day may be false a month hence.

Rich colors harmonize with rich brunette complexions and dark hair. Delicate colors are the most suitable for delicate and fragile styles of beauty. Very young ladies are never so suitably attired as in white. Ladies who dance should wear dresses of light and diaphanous materials, such as *tulle*, gauze, crape, net, etc., over colored silk slips. Silk dresses are not suitable for dancing. A married lady who dances only a few quadrilles may wear a *décolleté* silk dress with propriety.

Very stout persons should never wear white. It has the effect of adding to the bulk of the figure.

Black and scarlet, or black and violet, are worn in mourning.

However fashionable it may be to wear very long dresses, those ladies who go to a ball with the intention of dancing, and enjoying the dance, should cause their dresses to be made short enough to clear the ground. It is better to accept this slight deviation from fashion than to appear for three parts of the evening in a torn and pinned-up skirt.

Well-made shoes, whatever their color or material, and faultless gloves, are indispensable to the effect of a ballroom toilette.

Jewelry in the ballroom is a matter of taste. Beautiful flowers are the loveliest ornaments that a lady can wear on these occasions.

At small dinner parties, low dresses are not so indispensable as they were held to be some years since. High dresses of transparent materials, and low bodices with fichus of lace, are considered sufficiently full dress on these occasions. At large dinners only the fullest dress is appropriate.

Very young ladies should wear but little jewelry. Pearls are deemed most appropriate for the young and unmarried.

Diamonds, pearls, rubies, and all transparent precious stones, belong to evening dress, and should on no account be worn before dinner. In the morning let your rings be of the more simple and massive kind; wear no bracelets; and limit your jewelry to a good brooch, gold chain, and watch. Your diamonds and pearls would be as much out of place during the morning as a low dress, or a wreath.

It is well to remember in the choice of jewelry that mere costliness is not always the test of value; and that an exquisite work of art, such as a fine cameo, or a natural rarity, such as black pearl, is a more *distingué* possession than a large brilliant which any rich and tasteless vulgarian can buy as easily as yourself. Of all precious stones, the opal is one of the most lovely and least commonplace. No vulgar woman purchases an opal. She invariably prefers the more showy ruby, emerald, or sapphire.

A true gentlewoman is always faultlessly neat. No richness of toilette in the afternoon, no diamonds in the evening, can atone for unbrushed hair, a soiled collar, or untidy slippers at breakfast.

Never be seen in the street without gloves. Your gloves should fit to the last degree of perfection.

In these days of public baths and universal progress, we trust that it is unnecessary to do more than hint at the necessity of the most fastidious personal cleanliness. The hair, the teeth, the nails, should be faultlessly kept; and a muslin dress that has been worn once too often, a dingy pocket-handkerchief, or a soiled pair of light gloves, are things to be scrupulously avoided by any young lady who is ambitious of preserving the exterior of a gentlewoman.

Your shoes and gloves should always be faultless.

Perfumes should be used only in the evening, and then in moderation. Let your perfumes be of the most delicate and *recherché* kind. Nothing is more vulgar than a coarse, ordinary scent; and of all coarse, ordinary scents, the most objectionable are musk and patchouli.

Finally, every lady should remember that to dress well is a duty which she owes to society; but that to make it her idol is to commit something worse than a folly. Fashion is made for woman; not woman for fashion.

DRESS FOR MEN

A gentleman should always be so well dressed that his dress shall never be observed at all. Does this sound like an enigma? It is not meant for one. It only implies that perfect simplicity is perfect elegance, and that the true test of taste in the toilet of a gentleman is its entire harmony, unobtrusiveness, and becomingness. If any friend should say to you, "What a handsome waistcoat you have on!" you may depend that a less handsome waistcoat would be in better taste. If you hear it said that Mr. So-and-So wears superb jewelry, you may conclude beforehand that he wears too much. Display, in short, is ever to be avoided, especially in matters of dress. The toilette is the domain of the fair sex. Let a wise man leave its graces and luxuries to his wife, daughters, or sisters, and seek to be himself appreciated for something of higher worth than the stud in his shirt or the trinkets on his chain.

To be too much in the fashion is as vulgar as to be too far behind it. No really well-bred man follows every new cut that he sees in his tailor's fashion-book.

In the morning wear frock coats, double-breasted waistcoats, and trousers of light or dark colors, according to the season.

In the evening, though only in the bosom of your own family, wear only black, and be as scrupulous to put on a dress coat as if you expected visitors. If you have sons, bring them up to do the same. It is the observance of these minor trifles in domestic etiquette which marks the true gentleman.

For evening parties, dinner parties, and balls, wear a black dress coat, black trousers, black silk or cloth waistcoat, white cravat, white or gray kid gloves, and thin patent leather shoes. A black cravat may be worn in full dress, but is not so elegant as a white one.

Let your jewelry be of the best, but the least gaudy description, and wear it very sparingly. A single stud, a gold watch and guard, and one handsome ring, are as many ornaments as a gentleman can wear with propriety.

For a ring, the gentleman of fine taste would prefer a precious antique *intaglio* to the handsomest diamond or ruby that could be bought.

Unless you are a snuff-taker, never carry any but a white pocket-handkerchief.

If in the morning you wear a long cravat, fastened by a pin, be careful to avoid what may be called *alliteration* of color. We have seen a turquoise pin worn in a violet-colored cravat, and the effect was frightful. Choose, if possible, complementary colors, and their secondaries. For instance, if the stone in your pin be a turquoise, wear it with brown, or crimson mixed with black, or black and orange; if a ruby, contrast it with shades of green. The same rule holds good with regard to the mixture and contrast of colors in your waistcoat and cravat. Thus, a buff waistcoat and a blue tie, or brown and blue, or brown and green, or brown and magenta, green and magenta, green and mauve, are all good arrangements of color.

Colored shirts may be worn in the morning; but they should be small in pattern and quiet in color.

MORNING AND EVENING PARTIES

The morning party is a modern invention. It was unknown to our fathers and mothers, and even to ourselves till quite lately. A morning party is given during the months of June, July, August, September, and sometimes October. It begins about four o'clock and ends about seven, and the entertainment consists for the most part of conversation, music, and (if there be a garden) croquet, lawn tennis, etc. The refreshments are given in the form of a *déjeûner à la fourchette*. Receptions are held during the winter season.

Elegant morning dress, general good manners, and some acquaintance with the topics of the day and the games above named, are all the qualifications especially necessary to make you agreeable at a morning party, and "At Homes"; music and elocution at receptions.

An evening party begins about nine o'clock P.M., and ends about midnight, or somewhat later. Good breeding neither demands that you should present yourself at the commencement, nor remain till the close of the evening. You come and go as may be most convenient to you, and by these means are at liberty, during the height of the season when evening parties are numerous, to present yourself at two or three houses during a single evening.

When your name is announced, look for the lady of the house, and pay your respects to her before you even seem to see any other of your friends who may be in the room. At very large and fashionable receptions, the hostess is generally to be found near the door. Should you, however, find yourself separated by a dense crowd of guests, you are at liberty to recognize those who are near you, and those whom you en-

counter as you make your way slowly through the throng.

If you are at the house of a new acquaintance and find yourself among entire strangers, remember that by so meeting under one roof you are all in a certain sense made known to one another, and should, therefore, converse freely, as equals. To shrink away to a side-table and affect to be absorbed in some album or illustrated work; or, if you find one unlucky acquaintance in the room, to fasten upon her or him, like a drowning man clinging to a spar, are *gaucheries* which no shyness can excuse.

At an evening party do not remain too long in one spot. To be afraid to move from one drawing-room to another is the sure sign of a neophyte in society.

If you have occasion to use your handkerchief, do so as noiselessly as possible. To blow your nose as if it were a trombone, or to turn your head aside when using your handkerchief, are vulgarities scrupulously to be avoided.

Never stand upon the hearth with your back to the fire or stove, either in a friend's house or your own.

Never offer any one the chair from which you have just risen, unless there be no other disengaged.

If, when supper is announced, no lady has been specially placed under your care by the hostess, offer your arm to whichever lady you may have last conversed with.

If you possess any musical accomplishments, do not wait to be pressed and entreated by your hostess, but comply immediately when she pays you the compliment of inviting you to play or sing. Remember, however, that only the lady of the house has the right to ask you. If others do so, you can put them off in some polite way; but must not comply till the hostess herself invites you.

Be scrupulous to observe silence when any of the company are playing or singing. Remember that they are doing this for the amusement of the rest; and that to talk at such a time is as ill-bred as if you were to turn your back upon a person who was talking to you and begin a conversation with some one else.

If you are yourself the performer, bear in mind that in music, as in speech, "brevity is the soul of wit." Two verses of a song, or four pages of a piece, are at all times enough to give pleasure. If your audience desire more they will ask for it; and it is infinitely more flattering to be encored than to receive the thanks of your hearers, not so much in gratitude for what you have given them, but in relief that you have left off. You should try to suit your music, like your conversation, to your company. A solo of Beethoven's would be as much out of place in some circles as a comic song at a Quaker's meeting. To those who only care for the light popularities of the season, give Verdi, Suppé, Sullivan, or Offenbach. To connoisseurs, if you perform well enough to venture, give such music as will be likely to meet the exigencies of a fine taste. Above all, attempt nothing that you can not execute with ease and precision.

If you sing comic songs be careful that they are of the most unexceptionable kind, and likely to offend neither the tastes nor prejudices of the society in which you find yourself.

If the party be of a small and social kind, and those games called by the French *les jeux innocents* are proposed, do not object to join in them when invited. It may be that they demand some slight exercise of wit and readiness, and that you do not feel yourself calculated to shine in them; but it is better to seem dull than disagreeable, and those who are obliging can always find some clever neighbor to assist them in the moment of need. The game of "consequences" is one which unfortunately gives too much scope to liberty of expression. If you join in this game, we can not too earnestly enjoin you never to write down one word which the most pure-minded woman present might not read aloud without a blush. Jests of an equivocal character are not only vulgar, but contemptible.

Impromptu charades are frequently organized at friendly parties. Unless you have really some talent for acting and some readiness of speech, you should remember that you only put others out and expose your own inability by taking part in these entertainments. Of course, if your help is really needed and you would disoblige by refusing, you must do your best, and by doing it as quietly and coolly as possible, avoid being awkward or ridiculous.

Should an impromptu polka or quadrille be got up after supper at a party where no dancing was intended, be sure not to omit putting on gloves before you stand up. It is well always to have a pair of white gloves in your pocket in case of need; but even black are better under these circumstances than none.

Even though you may take no pleasure in cards, some knowledge of the etiquette and rules belonging to the games most in

vogue is necessary to you in society. If a fourth hand is wanted at euchre, or if the rest of the company sit down to a round game, you would be deemed guilty of an impoliteness if you refused to join.

The games most commonly played in society are euchre, bridge, draw-poker, and whist.

Never let even politeness induce you to play for high stakes. Etiquette is the minor morality of life; but it never should be allowed to outweigh the higher code of right and wrong.

In retiring from a crowded party it is unnecessary that you should seek out the hostess for the purpose of bidding her a formal good-night. By doing this you would, perhaps, remind others that it was getting late, and cause the party to break up. If you meet the lady of the house on your way to the drawing-room door, take your leave of her as unobtrusively as possible, and slip away without attracting the attention of her other guests.

ETIQUETTE OF THE BALLROOM

On entering the ballroom, the visitor should at once seek the lady of the house, and pay his respects to her. Having done this, he may exchange salutations with such friends and acquaintances as may be in the room.

If the ball be a public one, and a gentleman desires to dance with any lady to whom he is a stranger, he must apply to a member of the floor committee for an introduction.

Even at private balls, no gentleman can invite a lady to dance without a previous introduction. This introduction should be effected through the lady of the house or a member of her family.

No lady should accept an invitation to dance from a gentleman to whom she has not been introduced. In case any gentleman should commit the error of so inviting her, she should not excuse herself on the plea of a previous engagement or of fatigue, as to do so would imply that she did not herself attach due importance to the necessary ceremony of introduction. Her best reply would be to the effect that she would have much pleasure in accepting his invitation if he would procure an introduction to her. This observation may be taken as applying only to public balls. At a private party the host and hostess are sufficient guarantees for the respectability of their guests; and although a gentleman would show a singular want of knowledge of the laws of society in acting as we have supposed, the lady who should reply to him as if he were merely an impertinent stranger in a public assembly-room would be implying an affront to her entertainers. The mere fact of being assembled together under the roof of a mutual friend is in itself a kind of general introduction of the guests to each other.

To attempt to dance without a knowledge of dancing is not only to make one's self ridiculous, but one's partner also. No lady or gentleman has a right to place a partner in this absurd position.

Never forget a ballroom engagement. To do so is to commit an unpardonable offence against good breeding.

It is not necessary that a lady or gentleman should be acquainted with the *steps* in order to walk gracefully and easily through a quadrille. An easy carriage and a knowledge of the figure is all that is requisite. A round dance, however, should on no account be attempted without a thorough knowledge of the steps and some previous practice.

No person who has not a good ear for time and tune need hope to dance well.

At the conclusion of a dance the gentleman bows to his partner, and either promenades with her round the room or takes her to a seat. Where a room is set apart for refreshments he offers to conduct her thither. At a public ball no gentleman would, of course, permit a lady to pay for refreshments. Good taste forbids that a lady and gentleman should dance too frequently together at either a public or private ball. Engaged persons should be careful not to commit this conspicuous solecism.

If a lady happens to forget a previous engagement, and stands up with another partner, the gentleman whom she has thus slighted is bound to believe that she has acted from mere inadvertence, and should by no means suffer his pride to master his good temper. To cause a disagreeable scene in a private ballroom is to affront your host and hostess, and to make yourself absurd. In a public room it is no less reprehensible.

Always remember that good breeding and good temper (or the appearance of good temper) are inseparably connected.

Young gentlemen are earnestly advised not to limit their conversation to remarks on the weather and the heat of the room. It is to a certain extent incumbent on them to do something more than dance when they invite a lady to join a quadrille. If it be only upon the news of the day, a gentleman

should be able to afford at least three or four observations to his partner in the course of a long half hour.

Gentlemen who dance can not be too careful not to injure the dresses of the ladies who do them the honor to stand up with them. The young men of the present day are singularly careless in this respect, and when they have torn a lady's delicate skirt appear to think the mischief they have done scarcely worth the trouble of an apology.

A gentleman conducts his last partner to the supper-room, and having waited upon her while there reconducts her to the ball-room.

Never attempt to take a place in a dance which has been previously engaged.

A thoughtful hostess will never introduce a bad dancer to a good one, because she has no right to punish one friend in order to oblige another.

It is not customary for married persons to dance too often together in society.

THE DINNER-PARTY

To be acquainted with every detail of the etiquette pertaining to this subject is of the highest importance to every lady. Ease, *savoir-faire*, and good-breeding are nowhere more indispensable than at the dinner-table, and the absence of them is nowhere more apparent. How to eat soup and what to do with a cherry-stone are weighty considerations when taken as the index of social status; and it is not too much to say, that a young woman who elected to take claret with her fish, or ate peas with her knife, would justly risk the punishment of being banished from good society.

An invitation to dinner should be replied to immediately, and unequivocally accepted or declined. Once accepted, nothing but an event of the last importance should cause you to fail in your engagement.

To be exactly punctual is the strictest politeness on these occasions. If you are too early, you are in the way; if too late you spoil the dinner, annoy the hostess, and are hated by the rest of the guests. Some authorities are even of opinion that in the question of a dinner-party "never" is better than "late"; and one author has gone so far as to say, "if you do not reach the house till dinner is served, you had better retire, and send an apology, and not interrupt the harmony of the courses by awkward excuses and cold acceptance."

When the party is assembled, the mistress or master of the house will name to each gentleman the lady whom he is to conduct to the table.

The lady who is the greatest stranger should be taken down by the master of the house, and the gentleman who is the greatest stranger should conduct the hostess. Married ladies take precedence of single ladies, elder ladies of younger ones, and so forth.

When dinner is announced, the host offers his arm to the lady of most distinction, invites the rest to follow by a few words or a bow, and leads the way. The lady of the house should then follow with the gentleman who is most entitled to that honor, and the visitors follow in the order that the master of the house has previously arranged. The lady of the house frequently remains, however, till the last, that she may see her guests go down in their prescribed order; but the plan is not a convenient one. It is much better that the hostess should be in her place as the guests enter the dining-room, in order that she may indicate their seats to them as they come in, and not find them all crowded together in uncertainty when she arrives. If cards with names are on the table seek that of the lady whom you have taken to dinner.

The number of guests at a dinner-party should always be determined by the size of the table. When the party is too small, conversation flags, and a general air of desolation pervades the table. When they are too many, every one is inconvenienced. A space of two feet should be allowed to each person. It is well to arrange a party in such wise that the number of ladies and gentlemen shall be equal.

The lady of the house takes the head of the table. The gentleman who led her down to dinner occupies the seat on her right hand, and the gentleman next in order of precedence that on her left. The master of the house takes the foot of the table. The lady whom he escorted sits on his right hand, and the lady next in order of precedence on his left.

The gentlemen who support the lady of the house should offer to relieve her of the duties of hostess. Many ladies are well pleased thus to delegate the difficulties of carving, and all gentlemen who accept invitations to dinner should be prepared to render such assistance when called upon. To offer to carve a dish, and then perform the office unskilfully, is an unpardonable *gaucherie*. Every gentleman should carve, and carve well.

As soon as you are seated at table, re-

move your gloves, place your table napkin across your knees, and remove the roll which you find probably within it to the left side of your plate.

The soup should be placed on the table first. All well-ordered dinners begin with soup, whether in summer or winter. The lady of the house should help it, and send it round without asking each individual in turn. It is as much an understood thing as the bread beside each plate, and those who do not choose it are always at liberty to leave it untasted.

In eating soup, remember always to take it from the side of the spoon, and to make no sound in doing so.

If the servants do not go round with wine, the gentlemen should help the ladies and themselves to sherry or sauterne immediately after the soup.

You should never ask for a second supply of either soup or fish; it delays the next course, and keeps the table waiting.

Never offer to "assist" your neighbors to this or that dish. The word is inexpressibly vulgar—all the more vulgar for its affectation of elegance. "Shall I send you some mutton?" or "may I help you to canvas back?" is better chosen and better bred.

As a general rule, it is better not to ask your guests if they will partake of the dishes, but to send the plates round, and let them accept or decline them as they please. At very large dinners it is sometimes customary to distribute little lists of the order of the dishes at intervals along the table. It must be confessed that this gives somewhat the air of a dinner at a hotel; but it has the advantage of enabling the visitors to select their fare, and, as "forewarned is forearmed," to keep a corner, as the children say, for their favorite dishes.

As soon as you are helped, begin to eat; or, if the viands are too hot for your palate, take up your knife and fork and appear to begin. To wait for others is now not only old-fashioned, but ill-bred.

Never offer to pass on the plate to which you have been helped.

If you are asked to take wine, it is polite to select the same as that which your interlocutor is drinking. If you invite a lady to take wine, you should ask her which she will prefer, and then take the same yourself. Should you, however, for any reason prefer some other vintage, you can take it by courteously requesting her permission.

The habit of taking wine with each other has almost wholly gone out of fashion. A gentleman may ask the lady whom he conducted down to dinner, or he may ask the lady of the house to take wine with him. But even these last remnants of the old custom are fast falling into disuse.

Unless you are a total abstainer, it is extremely uncivil to decline taking wine if you are invited to do so. In accepting, you have only to pour a little fresh wine into your glass, look at the person who invited you, bow slightly, and take a sip from the glass.

It is particularly ill-bred to empty your glass on these occasions.

Certain wines are taken with certain dishes, by old-established custom—as sherry or sauterne, with soup and fish; hock and claret, with roast meat; punch with turtle; champagne is served with fish, and the glasses refilled through the meal; port with venison; port or burgundy with game; sparkling wines between the roast and the confectionery; madeira with sweets; port with cheese; and for dessert, port, tokay, madeira, and sherry. Red wines should never be iced, even in summer.

If the servants do not go round with the wine (which is by far the best custom), the gentlemen at a dinner table should take upon themselves the office of helping those ladies who sit near them. Ladies take more wine in the present day than they did fifty years ago, and gentlemen should remember this, and offer it frequently. Ladies can not very well ask for wine, but they can always decline it. At all events they do not like to be neglected, or to see gentlemen liberally helping themselves, without observing whether their fair neighbors' glasses are full or empty.

Instead of cooling their wines in the ice-pail, some hosts introduce clear ice upon the table, broken up in small lumps, to be put inside the glasses. This can not be too strictly reprehended. Melting ice can but weaken the quality and flavor of the wine. Those who desire to drink *wine and water* can ask for iced water if they choose; but it savors too much of economy on the part of a host to insinuate the ice inside the glasses of his guests when the wine could be more effectually iced outside the bottle.

Be careful to know the shapes of the various kinds of wineglasses commonly in use, in order that you may never put forward one for another. High and narrow, and very broad and shallow glasses, are used for champagne; large, goblet-shaped glasses for burgundy and claret; ordinary

wineglasses for sherry and madeira; green glasses for hock; and somewhat large, bell-shaped glasses for port.

Port, sherry, and madeira are decanted. Hocks and champagnes appear in their native bottles. Claret and burgundy are poured from the bottles.

In helping soup, fish, or any other dish, remember that to overfill a plate is as bad as to supply it too scantily.

Silver fish-knives will now always be met with at the best tables; but where there are none, a piece of crust should be taken in the left hand, and the fork in the right. There is no exception to this rule in eating fish.

We presume it is scarcely necessary to remind the reader that he is never, under any circumstances, to convey his knife to his mouth. Peas are eaten with the fork; tarts, curry, and puddings of all kinds with the spoon.

Always help fish with a fish-slice, and tarts and puddings with a spoon, or, if necessary, a spoon and fork.

Asparagus must be helped with the asparagus-tongs.

In eating asparagus, it is well to observe what others do, and act accordingly. Some very well-bred people eat it with the fingers; others cut off the heads and convey them to the mouth upon the fork. It would be difficult to say which is the more correct.

In eating stone fruit, such as cherries, damsons, etc., the same rule had better be observed. Some put the stones out from the mouth into a spoon, and so convey them to the plate. Others cover the lips with the hand, drop them unseen into the palm, and so deposit them on the side of the plate. In our own opinion, the latter is the better way, as it effectually conceals the return of the stones, which is certainly the point of highest importance. Of one thing we may be sure, and that is that they must never be dropped from the mouth to the plate.

In helping sauce, always pour it on the side of the plate.

A silver knife and fork should be placed to each guest at dessert.

If you are asked to prepare fruit for a lady, be careful to do so by means of the silver knife and fork only, and never to touch it with your fingers.

It is wise never to partake of any dish without knowing of what ingredients it is composed. You can always ask the servant who hands it to you, and you thereby avoid all danger of having to commit the impoliteness of leaving it, and showing that you do not approve of it.

Never speak while you have anything in your mouth.

Be careful never to taste soups or puddings till you are sure they are sufficiently cool; as, by disregarding this caution, you may be compelled to swallow what is dangerously hot, or be driven to the unpardonable alternative of returning it to your plate.

When eating or drinking, avoid every kind of audible testimony to the fact.

Finger-glasses, containing water slightly warmed and perfumed, are placed to each person at dessert. In these you may dip the tips of your fingers, wiping them afterward on your table-napkin. If the finger-glass and doily are placed on your dessert-plate, you should immediately remove the doily to the left of your plate, and place the finger-glass upon it. By these means you leave the right for the wineglasses.

If you should unfortunately overturn or break anything, do not apologize for it. You can show your regret in your face, but it is not well-bred to put it into words.

Should you injure a lady's dress, apologize amply, and assist her, if possible, to remove all traces of the damage.

To abstain from taking the last piece on the dish, or the last glass of wine in the decanter, only because it is the last, is highly ill-bred. It implies a fear that the vacancy can not be supplied, and almost conveys an affront to your host.

Coffee and liqueurs should be handed round when the dessert has been about a quarter of an hour on the table. After this, the ladies generally retire.

Should no servant be present to do so, the gentleman who is nearest the door should hold it for the ladies to pass through.

When the ladies are leaving the dining-room, the gentlemen all rise in their places, and do not resume their seats till the last lady is gone.

To sit long in the dining-room after the ladies have retired is to pay a bad compliment to the hostess and her fair visitors; and it is still worse to rejoin them with a flushed face and impaired powers of thought. A refined gentleman is always temperate.

In summing up the little duties and laws of the table, a popular author has said that "the chief matter of consideration at the dinner-table—as, indeed, everywhere else in the life of a gentleman—is to be perfectly composed and at his ease. He speaks deliberately; he performs the most important

act of the day as if he were performing the most ordinary. Yet there is no appearance of trifling or want of gravity in his manner, he maintains the dignity which is so becoming on so vital an occasion. He performs all the ceremonies, yet in the style of one who performs no ceremonies at all. He goes through all the complicated duties of the scene as if he were 'to the manner born.'"

To the giver of a dinner we have but one or two remarks to offer. If he be a bachelor, he had better give his dinner at a good hotel. If a married man, he will, we presume, enter into council with his wife and his cook. In any case, however, he should always bear in mind that it is his duty to entertain his friends in the best manner that his means permit; and that this is the least he can do to recompense them for the expenditure of time and money which they incur in accepting his invitation.

To those ladies who have houses and servants at command, we have one or two remarks to offer. Every housekeeper should be acquainted with the routine of a dinner and the etiquette of a dinner-table. No lady should be utterly dependent on the taste and judgment of her cook. Though she need not know how to dress a dish, she should be able to judge of it when served. The mistress of the house, in short, should be to a cook what a publisher is to his authors—that is to say, competent to form a judgment upon their works, though himself incapable of writing even a magazine article.

If you wish to have a good dinner, and do not know in what manner to set about it, you will do wisely to order it from some first-rate *restaurateur*. By these means you ensure the best cookery and a faultless *carte*.

Bear in mind that it is your duty to entertain your friends in the best manner that your means permit. This is the least you can do to recompense them for the expenditure of time and money which they incur in accepting your invitation.

"To invite a friend to dinner," says Brillat Savarin, "is to become responsible for his happiness so long as he is under your roof."

A dinner, to be excellent, need not consist of a great variety of dishes; but everything should be of the best, and the cookery should be perfect. That which should be cool should be cool as ice; that which should be hot should be smoking; the attendance should be rapid and noiseless; the guests well assorted; the wines of the best quality; the host attentive and courteous; the room well lighted, and the time punctual.

Every dinner should begin with soup, be followed by fish, and include some kind of game. "The soup is to the dinner," we are told by Grisnod de la Regnière, "what the portico is to a building, or the overture to an opera."

To this aphorism we may be permitted to add that a *chasse* of cognac or curaçoa at the close of a dinner is like the epilogue at the end of a comedy.

Never reprove or give directions to your servants before guests. If a dish is not placed precisely where you would have wished it to stand, or the order of a course is reversed, let the error pass unobserved by yourself, and you may depend that it will be unnoticed by others.

The duties of hostess at a dinner-party are not onerous; but they demand tact and good breeding, grace of bearing, and self-possession of no ordinary degree. She does not often carve. She has no active duties to perform; but she must neglect nothing, forget nothing, put all her guests at their ease, encourage the timid, draw out the silent, and pay every possible attention to the requirements of each and all around her. No accident must ruffle her temper. No disappointment must embarrass her. She must see her old china broken without a sigh, and her best glass shattered with a smile.

The lady of the house should never send away her plate, or appear to have done eating, till all her guests have finished.

VISITING, BREAKFAST, LUNCHEON, ETC.

A visitor is bound by the laws of social intercourse to conform in all respects to the habits of the house. In order to do this effectually, she should inquire, or cause her personal servant to inquire, what those habits are. To keep your friend's breakfast on the table till a late hour; to delay the dinner by want of punctuality; to accept other invitations, and treat his house as if it were merely a hotel to be slept in; or to keep the family up till unwonted hours, are alike evidences of a want of good feeling and good breeding.

At breakfast and lunch absolute punctuality is not imperative; but a visitor should avoid being always the last to appear at table.

No order of precedence is observed at either breakfast or luncheon. Persons take

their seats as they come in, and, having exchanged their morning salutations, begin to eat without waiting for the rest of the party.

If letters are delivered to you at breakfast or luncheon, you may read them by asking permission from the lady who presides at the urn.

Always hold yourself at the disposal of those in whose house you are visiting. If they propose to ride, drive, walk, or otherwise occupy the day, you may take it for granted that these plans are made with reference to your enjoyment. You should, therefore, receive them with cheerfulness, enter into them with alacrity, and do your best to seem pleased, and be pleased, by the efforts which your friends make to entertain you.

You should never take a book from the library to your own room without requesting permission to borrow it. When it is lent, you should take every care that it sustains no injury while in your possession, and should cover it, if necessary.

A guest should endeavor to amuse herself as much as possible, and not be continually dependent on her hosts for entertainment. She should remember that, however welcome she may be, she is not always wanted.

A visitor should avoid giving unnecessary trouble to the servants of the house.

The signal for retiring to rest is generally given by the appearance of the servant with wine, water, and biscuits, where a late dinner hour is observed and suppers are not the custom. This is the last refreshment of the evening, and the visitor will do well to rise and wish good-night shortly after it has been partaken of by the family.

GENERAL HINTS

Do not frequently repeat the name of the person with whom you are conversing. It implies either the extreme of *hauteur* or familiarity.

Never speak of absent persons by only their Christian or surnames; but always as Mr. ——, or Mrs. ——. Above all never name anybody by the first letter of his name. Married people are sometimes guilty of this flagrant offence against taste.

Look at those who address you.

Never boast of your birth, your money, your grand friends, or anything that is yours. If you have traveled, do not introduce that information into your conversation at every opportunity. Any one can travel with money and leisure. The real distinction is to come home with enlarged views, improved tastes, and a mind free from prejudice.

If you present a book to a friend do not write his or her name in it unless requested. You have no right to presume that it will be rendered any the more valuable for that addition, and you ought not to conclude beforehand that your gift will be accepted.

Never undervalue the gift which you are yourself offering; you have no business to offer it if it is valueless. Neither say that you do not want it yourself nor that you should throw it away if it were not accepted, etc. Such apologies would be insults if true, and mean nothing if false.

No compliment that bears insincerity on the face of it is a compliment at all.

Presents made by a married lady to a gentleman can only be offered in the joint names of her husband and herself.

Married ladies may occasionally accept presents from gentlemen who visit frequently at their houses, and who desire to show their sense of the hospitality which they receive there.

Acknowledge the receipt of a present without delay.

Address a foreigner by his name in full, as Monsieur de Vigny—never as *Monsieur* only. In speaking of him, give him his title, if he has one. Foreign noblemen are addressed *viva voce* as Monsieur. In speaking of a foreign nobleman before his face, say Monsieur le Comte, or Monsieur le Marquis. In his absence, say Monsieur le Comte de Vigny.

Converse with a foreigner in his own language. If not competent to do so, apologize, and beg permission to speak English.

BRIEF RULES OF ETIQUETTE FOR EVERY ONE

INTRODUCTIONS

Shaking hands after an introduction has taken place is merely optional, not necessary.

A friend visiting at your house must be introduced to all callers, who are bound to continue the acquaintance as long as the friend is your guest.

A gentleman must always raise his hat, if introduced in the street, to either lady or gentleman.

Letters of introduction to and from business men, for business purposes, may be delivered by the bearers in person, and etiquette does not require the receiver to entertain the person introduced as the private friend of the writer.

AT A BALL

If a gentleman escort a lady to a ball, he should call for her at the appointed hour, in a carriage, and send a bouquet early in the day. Upon arriving at the house where the ball is held, escort your charge to the dressing-room door. She may or may not dance the first dance with you. Ask her. You must see that she gets her supper, and offer to leave the ball at any hour that she may be desirous of so doing.

No gentleman should wait for the start of the music to engage a partner.

"May I have the pleasure of the waltz or quadrille with you," is all that a gentleman need say on introduction. If the lady says yes, he asks permission to write his name on her card.

Always give your arm to a lady in crossing a ball-room.

Do not feel slighted if your fair companion does not invite you to enter her home on returning from the ball. If she does invite you, decline.

AT HOMES, RECEPTIONS, PARTIES

Parties in cities consist of—at homes, receptions, conversaziones, private concerts, private theatricals, soirées, dramatic tea-parties, matinées, or a gathering of people.

In the country, the indoor parties comprise small dancing-parties, tea-parties, and conversaziones; but the outdoor occasions are of much greater number and variety; lawn-tennis parties, croquet, sailing, and boating parties, picnics, private fêtes, berrying parties, nutting parties, May festivals, Fourth of July festivals, anything for a day spent in outdoor frolic.

For "Receptions" and "At Homes" and conversaziones invitations should be sent out a week beforehand.

At a reception you have music and singing, perhaps recitations. Light refreshments are served, and the hostess makes the most of her rooms in display, etc.

Gentlemen should take elderly ladies in to refreshments.

Let amateur performers learn something off by heart. Being provided with notes is not stylish.

Let no person offer to turn over the leaves of a music book for a performer unless he or she can read music rapidly.

If you play an accompaniment, show off the singer, not yourself.

If you get up private theatricals, secure the best amateur talent.

Be punctual at lawn-tennis and croquet parties.

Gentlemen at picnics must turn into waiters for the *nonce*, and look to the appetites of the ladies.

SALUTATIONS

Do not insult by offering two fingers when shaking hands.

Remove your right hand glove in the street; retain it in the house.

Do not wring off the wrist of the person with whom you shake hands.

The lady recognizes the gentleman first by bowing. The gentleman must wait till he is bowed to by the lady.

When a lady is desirous of ending a conversation in the street she should bow slightly, and the gentleman must instantly take his leave.

If the lady "proceeds upon her way" without breaking up conversation, then the gentleman is bound to join her in the promenade.

At home, the lady extends her hand to every guest.

A gentleman is at liberty to bow to a lady seated at a window, but if he is in the window he is not to bow to a lady in the street.

The gentleman never offers to shake hands with the lady. It is her prerogative to stretch forth her hand to his.

A gentleman may at all times bow to a lady he may meet on a stairway, even if not

acquainted. If at the foot of the stairs, he must bow, pass her and ascend before her. If at the head of the stairs, he must bow, and wait for her to precede him in the descent.

If a gentleman is walking with a friend, and the friend bows to a lady, he is bound to bow, although he may be unacquainted with the lady.

DINNER

Gentlemen should stand behind their respective chairs until all the ladies are seated, and then take their own seats. Care should be taken that their chairs do not stand upon the dresses of the ladies beside them.

Always say "Thank you" to the servant or waiter; never say merely "Thanks."

Never decline wine by clapping your hand on top of your glass.

Do not eat ravenously.

Do not smack the lips.

Never take a long, deep breath after you finish eating, as if you were weary.

Make no noises in your mouth or throat.

Do not suck your teeth or roll your tongue around the outside of your gums.

Never put your knife into your mouth. It is an antiquated custom, and brands one as not "up to date."

Do not pick your teeth, or plunge your finger into your mouth.

Do not spit out fish-bones upon your plate.

Never take the bones of fowl or birds up in your fingers to gnaw or suck them. Remove the meat with your knife, and convey it to your mouth with your fork. Do not polish or scrape the bone.

Wipe your finger-tips upon the table napkin.

Do not use the tablecloth to wipe your mouth.

Do not either praise or dispraise what is placed before you.

Do not drink or speak when you have anything in your mouth.

When you are helped begin to eat.

Never watch the dishes as they are uncovered, or cry out when you perceive something dainty.

Do not attempt to tuck your napkin, bib-fashion, into your shirt collar. Unfold it partially and place it in your lap, covering your knees. A lady may slip a corner under her belt if there is danger of its falling upon her dress.

Do not talk loudly. Do not whisper. Do not laugh too loudly.

Use the table articles, such as spoon, butter-knife, etc., etc.

Never clean your plate. Leave something on it.

Never attempt to propose a toast or sentiment, at all events, till the dessert is well over. We have seen men attempt this before the roasts appeared. It brands one as unaccustomed to society.

Take chablis or hock with your oysters or clams.

Take sherry with your soup.

Take champagne with the entrées.

Take Burgundy with game.

Take port with cheese.

Take claret, if you wish it, after dessert.

Take a liqueur after coffee.

Never spit the skins of grapes, the stones or pips of fruits. Receive them in your spoon, or concealed in your hand, and place them upon the edge of your plate.

Do not play with your fingers upon the table.

Do not play with your knife and fork, fidget with your salt-cellar, balance your spoon on your tumbler, or make pills of your bread.

Do not mix up the various articles of food upon your plate.

Never overload your fork or spoon.

Do not illustrate your anecdotes by plans drawn upon the table with your nail.

Do not stretch your feet under the table, so as to touch those of your opposite neighbor.

Do not tilt your chair.

Endeavor to take an easy position at table, neither pressing too closely up to it, nor yet so far away as to risk depositing your food upon the floor.

Give your neighbor as much elbow room as possible.

If the dinner is for gentlemen guests alone, and the lady of the house presides, her duties are over when she rises after dessert. The gentlemen do not expect to see her again. Cigars may be served with the coffee, and then the servants may retire.

In case of a stag party, like this, the lady of the house is much better away. Then the *oldest* friend of the host takes her seat.

FUNERALS

Do not speak loudly in the house of mourning. Do not ask to see the members of the bereaved family. Invitations are sometimes printed, and in this form:

> You are respectfully invited to attend the funeral of Mr. John Smith on Friday, June 28, 1901, at 9 o'clock a. m., from his late residence, 148 West 68th street. To proceed to Cypress Grove Cemetery.

If the services are at church, the correct form is:

You are respectfully invited to attend the funeral of Mr. John Smith, from the Church of the Nativity, Madison Avenue, on Friday, June 28th, at 9 o'clock a. m. To proceed to Cypress Grove Cemetery.

No further notice need be sent if the invitation is given through the newspapers.

Do not go to the house of your dead friend until the hour named. The last moments are indeed precious to the grief-stricken relatives.

The clergyman leaves the house first, and enters the carriage that leads the procession; the hearse comes next; then come the relatives.

Do not salute the relatives.

The master of the ceremonies assists at the carriages, also at the church.

Hats must be removed as the casket passes from the hearse to the church, and from the church to the hearse, and a double line formed.

Wear black clothes, or as near to that color as may be.

Send flowers only on the morning of the funeral.

Pall-bearers must be the immediate friends of the deceased.

Leave cards for the family of the deceased during the week following the obsequies. The proper person to purchase mourning is the nearest lady friend of the family.

HOTELS

Ladies traveling alone will request the escort of a waiter from the dining-room door to the table.

Ladies will make up their minds quickly as to what dishes they propose to order.

Ladies will accept table civilities from gentlemen, such as passing salt, etc.

The piano of the hotel is public property, but a lady should be careful about monopolizing it.

Ladies will not linger in the hall, and will avoid the public entrance.

Recognition across the dining-room is not required.

AMUSEMENTS

Gentlemen will always invite another lady to accompany a young lady in taking her for the *first time* to a place of amusement.

Give the ladies as long a notice as possible.

A lady does not bow across a theatre, a gentleman does.

No lady stares round a theatre with an opera-glass.

During the performance speak in a low tone.

The gentleman walks before the lady until he reaches the seat, then he bows her into her seat.

Never leave the lady alone.

Never stand in the way of others in picture galleries.

It is permissible for a gentleman to join ladies for a moment or two between the acts.

Be careful to enter a place of amusement as quietly and unostentatiously as possible.

Never laugh loudly, and if you applaud do so earnestly, but not too energetically. Never use the feet in applauding.

BY BOAT AND RAIL

Ladies will not permit their escorts to enter any apartment reserved for ladies only.

Ladies traveling alone should consult conductors or captains. Ladies will thank gentlemen who raise or lower windows, coldly, but politely.

If a person crushes or crowds you, and apologizes, accept the apology by a slight bow.

Gentlemen escorts must pay the most delicate and earnest care to the lady or ladies under their care. The attention must be unremitting.

Courtesies in traveling are always *en règle,* but there must be no attempt at familiarity.

Gentlemen will commence conversations.

Gentlemen will assist ladies to alight from the cars.

A gentleman may offer to escort a lady to the refreshment saloon.

THE STREET

Ladies bow first to gentlemen. The gentleman so saluted lifts his hat and bows.

Gentlemen will offer to carry parcels for ladies.

Gentlemen do not smoke when walking with ladies.

Candy or bananas, or other food, should not be eaten in the street. Above all, never eat peanuts in public places.

Ladies and old gentlemen are given the portion of the sidewalk next to the houses.

Ladies should not walk too rapidly.

Ladies may accept umbrella assistance from male friends and acquaintances, but from strangers never.

In crossing through a narrow place, or across a plank, or indoors, the lady goes first.

A gentleman may assist a lady to cross a puddle or across a crowded street.

A gentleman should never let a lady stand in a railway car, a street car, a stage, or a ferry-boat, if he has a seat to offer her.

A gentleman will pass a lady's fare in a street car or stage.

No lady will salute across a street.

A very stiff bow gives the "cut."

Young people must wait for recognition from their elders.

Gentlemen will open store, and all other doors for ladies to pass, lifting hat at same time.

Do not bow from a store to a person in the street.

VISITS

"You'll come and see me some time," is no invitation. Remember this, and do not feel hurt if the person so "invited" never comes.

If you are asked by letter to make a visit, reply at once.

If you are asked to visit friends for any period, write at once and name the time most convenient to yourself.

Hosts should always have a guest room, and special care should be given to it. It should be warmed in winter and cooled in summer. Its comforts should be made a study.

Hosts should either meet or send to the depot for their guests. The baggage should be looked after, and any trouble spared the person invited.

If the guest arrives in the morning, special breakfast should be prepared; if at night, special supper. If the guest is delicate or a late riser, special meals should be prepared.

Guests will conform as much as possible to the habits of their hosts.

Hosts will amuse their guests as much as possible, by entertainments, by taking them to places of interest, and by introductions to entertaining people.

The hostess need not appear between breakfast and luncheon. She has her household duties to attend to.

No guest will make an outside engagement without consulting the host.

Hosts will accept no invitations that do not include their guests.

Guests should bring their own writing materials, sewing materials, wools, etc. Ladies may volunteer to assist the hostess in sewing, etc.

Guests may use the servants as if they were their own, but always in reason.

If a guest injures anything in the house at which he or she may be stopping, such as a glass bowl, a painting, etc., he or she will repair the loss by sending an article similar to that which has been injured.

Gentlemen may send gifts of flowers, candies, bonbons, etc.; and guests may always present the baby with a gift.

Do not open any letters delivered to you in the presence of your host and hostess without saying, "Have I your permission?" Hosts will do the same toward their guests.

No lady guest pays for anything, carriage, boat, car, or refreshments.

Hosts, when their guests are about to leave, will see that the baggage is cared for, and will leave the guest at the depot or boat.

HOW TO PRESERVE YOUR HEALTH

THE FUNDAMENTAL principle of all efforts to improve and preserve health has been thus stated: "Man, as an organized being, is subject to organic laws, as much as the inanimate bodies which surround him are to laws mechanical and chemical; and we can as little escape the consequences of neglect or violation of those natural laws, which affect organic life through the air we breathe, the food we eat, and the exercise we take, as a stone projected from the hand, or a shot from the mouth of a cannon, can place itself beyond the bounds of gravitation." It may be added, that "all human science, all the arts of civilized man, consist of discoveries made by us of the laws impressed upon nature by the Author of the universe, and the applications of those laws to the conditions—which are laws also—in which man and the particular bodies and substances around him are placed; nor, it is manifest, should any science concern us more than that which relates to the conditions on which organic life is held by each individual."

The leading conditions essential to health may be thus enumerated: 1. A constant supply of pure air; 2. A sufficiency of nourishing food, rightly taken; 3. Cleanliness; 4. A sufficiency of exercise to the various organs of the system; 5. A right temperature; 6. A sufficiency of cheerful and innocent enjoyments; and, 7. Exemption from harassing cares.

OUTLINES OF THE LAWS OF HEALTH

AIR AND ITS USES

THE common air is a fluid composed mainly of two gases, in certain proportions; namely, oxygen as twenty and nitrogen as eighty parts in a hundred, with a very minute addition of carbonic acid gas. Such is air in its pure and right state, in which we require it for respiration. When it is loaded with any admixture of a different kind, or its natural proportions are in any way deranged, it can not be breathed without producing injurious results. The lungs of a healthy full-grown man will inhale twenty cubic inches of air at every inspiration, and he will use no less than fifty-seven hogsheads in twenty-four hours.

Various circumstances tend to surround us at times with vitiated air, and must accordingly be guarded against. That first

is the miasma or noxious quality imparted to the air in certain districts by stagnant water and decaying vegetable matter. Being a subtle poison, it acts on the human system to produce fevers and other epidemics.

Putrid matter of all kinds is another conspicuous source of noxious effluvia—the filth collected in ill-regulated towns, ill-managed drains, collections of decaying animal substances—all these vitiate the atmosphere and generate disease.

A human being tends to vitiate the atmosphere for himself, by the effect produced on the air he breathes. On passing into the lungs, the oxygen, forming the lesser ingredient of the air, enters into combination with the carbon of the venous blood (or the blood in the veins, which has already performed its round through the body); about two-fifths of the oxygen being abstracted, the remaining three-fifths being expired, along with the nitrogen nearly as it was before. In place of the oxygen consumed, there is expired an equal volume of carbonic acid gas, which results from the combination just described. Now, carbonic acid gas, in a larger proportion than is found in the atmosphere, is noxious. The volume expired by the lungs, if free to mingle with the air at large, will do no harm; but, if breathed out into a close room, it will poison the air. If an individual be shut up in an air-tight box, each breath he emits throws a certain quantity of carbonic acid gas into the air within the box; so vitiating it at every successive expiration that at length the oxygen is exhausted and is insufficient to support life. He would then be sensible of a great difficulty in breathing, and in a little time longer he would die.

Most living rooms are not strictly close, but in ordinary apartments where human beings are assembled, the air often becomes *considerably vitiated.* In such situations there can not be a sufficiently copious supply of oxygen to make up for what has been consumed, and the carbonic acid gas constantly accumulates. This is particularly the case in bedrooms, theatres, churches, and schools.

Perhaps it is in bedrooms that most harm is done. They are generally smaller than other rooms, and are usually kept close during the whole night. The result of sleeping in such a room is very injurious. A common fire, from the draught which it produces, is very serviceable in ventilating a room, but it is at best a defective means. The draught which it creates generally sweeps along near the floor between the door and the fire, leaving all above the level of the chimney-piece unpurified. Yet scarcely any other arrangement is anywhere made for the purpose of changing the air in ordinary rooms.

FOOD AND NUTRITION

The second requisite for the preservation of health is a sufficiency of nutritious food.

Organic bodies, in which are included vegetables as well as animals, are constituted upon the principle of *a continual waste of substance supplied by continual nutrition.*

The Nutritive System of animals, from the humblest to the highest, comprehends an *alimentary tube or cavity,* into which food is received, and from which, after undergoing certain changes, it is diffused throughout the whole structure. This tube, and the other apparatus connected with the taking of food, show, in different animals, varieties of structure, all in conformity with the quality and amount of food which the particular animals are designed to take.

Some animals are formed to live upon vegetable substances alone; others are calculated to live upon the flesh of other animals. Herbivorous animals, as the former are called, have generally a long and complicated alimentary tube, because the nutritious part of such food, being comparatively small in proportion to the whole bulk, requires a greater space in which to be extracted and absorbed into the system. The sheep, for example, has a series of intestines twenty-seven times the length of its body. For the opposite reasons carnivorous or flesh-devouring animals and the rapacious birds have generally a short intestinal canal. The former class of animals are furnished with teeth calculated by their broad and flat surfaces, as well as by the lateral movement of the jaws in which they are set, to mince down the herbage and grain eaten by them. But the carnivorous animals, with wide-opening jaws, have long and sharp fangs to seize and tear their prey. These peculiarities of structure mark sufficiently the designs of nature with respect to the kinds of food required by the two different classes of animals for their support.

The human intestinal canal being of medium length, and the human teeth being a mixture of the two kinds, it necessarily follows that man was designed to eat both vegetable and animal food. As no animal can live comfortably except in conformity

with the laws of its constitution, it follows that man will not thrive unless with a mixture of animal and vegetable food. The followers of Pythagoras argued, from the cruelty of putting animals to death, that it was proper to live on vegetables alone, and many eccentric persons of modern times have acted upon this rule But the ordinances of Nature speak a different language; and, if we have any faith in these, we can not for a moment doubt that a mixture of animal food is necessary for our well-being. On the other hand, we can not dispense with vegetable food without injurious consequences. In that case we place in a medium alimentary canal a kind of food which is calculated for a short one, thus violating an arrangement of the most important nature. A balance between the two kinds of food is what we should observe, if we would desire to live a natural and consequently healthy life.

RULES CONNECTED WITH EATING

In order fully to understand how to eat, what to eat, and how to conduct ourselves after eating, it is necessary that we should be acquainted in some measure with the *process of nutrition.*

Food, on being received into the mouth, has two processes to undergo, both very necessary to digestion. It has to be masticated, or chewed down, and also to receive an admixture of saliva. Unless food be well broken down or masticated, and also well mixed up with the salivary fluid, it will be difficult to digest. The stomach is then called upon to do, besides its own proper duty, that which properly belongs to the teeth and saliva, and is thus overburdened and embarrassed. The pains of indigestion are the immediate consequence, and other injuries follow on the persistent habit.

It is therefore to be concluded that *a deliberate mastication of our food is conducive to health, and that fast eating is injurious, and sometimes even dangerous.*

The food, having been properly masticated, is, by the action of the tongue, thrown into the gullet. It then descends into the stomach, being urged along by the contractions and motions of the muscles lining this canal. The stomach may be considered as an expansion of the gullet, and is a membranous pouch or bag, very similar in shape to a bagpipe. It has two openings, one by which the food enters, the other by which it passes out. Into the greater curvature of this bag the gullet enters; and at the other end, opening into the adjoining portion of the canal, the half-digested mass is next propelled.

When food has been introduced, the two orifices close, and the mass, already saturated with saliva, and so broken down as to expose all its particles to the action of the gastric juice, is now submitted to the action of a fluid, which is freely secreted by the vessels of the stomach. The most remarkable quality of this juice is its solvent power, which is prodigious.

The process of digestion in the stomach is generally completed in from half an hour to two or three hours; according to the nature and volume of the food taken, and the mastication and insalivation it has undergone.

It is thus converted into a soft, gray, pulpy mass, called *chyme,* which, by the muscular contraction of the stomach, is urged on into the adjoining part of the alimentary canal, called the *duodenum.*

In the duodenum, it is intimately mixed with bile and pancreatic juice; also with a fluid secreted by the mucous follicles of the intestine itself, and undergoes a change in its appearance; assuming a yellow color and bitter taste, owing to the predominance of bile. Its character varies according to the nature of the food that has been taken.

The *chyme,* having undergone the changes described, is urged onward by the peristaltic motion of the intestines. This curious motion is caused by the contraction of the muscular coat of the intestinal canal, and one of the principal uses ascribed to the bile is that of stimulating this motion. If the peristaltic motion be diminished, owing to a deficiency of bile, then the progress of digestion is retarded, and the body becomes constipated. In such cases, calomel, the blue pill, and other medicines, are administered for the purpose of stimulating the liver to secrete the biliary fluid that it may quicken by its stimulating properties the peristaltic action. But this is not the only use of the bile; it also assists in separating the nutritious from the non-nutritious portion of the alimentary mass; the former being termed *chyle.* The *chyme* thus mixed with *chyle* arrives in the small intestines, on the walls of which a series of exquisitely delicate vessels ramify in every direction. These absorb or take up the *chyle,* leaving the rest of the mass to be ejected from the body. The *chyle* is then carried into little bodies of glands, where it is still further elaborated, acquir-

ing additional nutritious properties; after which, corresponding vessels, emerging from these glands, carry along the fluid to a comparatively large vessel, called the thoracic duct, which ascends in the abdomen along the side of the backbone, and pours it into that side of the heart to which the blood that has already circulated through the body returns. Here it is intimately mixed with the blood, and is propelled into the lungs, where it undergoes, from exposure to the action of the air breathed, the changes necessary to render it again fit for circulation. In the lungs, therefore, the process of digestion is completed; the blood has now acquired those nutrient properties from which it secretes the new particles of matter adapted to supply the waste of the different textures of the body.

When food is received into the stomach, the secretion of the gastric juice immediately commences; and when a full meal has been taken, this secretion generally lasts for about an hour. It is a law of vital action, that when any living organ is called into play, there is immediately an increased flow of blood and nervous energy toward it. The stomach, while secreting its fluid, displays this phenomenon, and the consequence is, that the blood and nervous energy are called away from other organs. This is the cause of that chilliness at the extremities which we often feel after eating heartily. So great is the demand which the stomach thus makes upon the rest of the system, that, for some time after a meal, we are not in condition for strong exercise of any kind. Both body and mind are inactive and languid, simply because that which supports muscular and mental activity is concentrated for the time upon the organs of digestion. This is an arrangement of nature which a regard to health requires should not be interfered with. *We should indulge in the muscular and mental repose which is demanded: and this should last for not much less than an hour after every meal.* In that time the secretion of gastric juice is nearly finished; the new nutriment begins to tell upon the general circulation; and we are again fit for active exertion.

Strong exercise or mental application during or immediately after a meal diverts the flow of blood to the stomach, and the process of digestion is necessarily retarded or stopped. Confusion is introduced into the system, and a tendency to the terrible calamity of dyspepsia is established.

For the same reason that repose is required after a meal, it is necessary, in some measure, for a little while before. At the moment when we have concluded a severe muscular task, such, for example, as a long walk, the flow of nervous energy and of circulation is strongly directed to the muscular system. It requires some time to allow this flow to stop and subside; and, till this takes place, it is not proper to bring the stomach into exercise, as the demand it makes when filled would not in that case be answered. Just so, if we be engaged in close mental application, the nervous energy and circulation being in that case directed to the brain, it is not right all at once to call another and distant organ into play; some time is required to allow of the energy and circulation being prepared to take the new direction. It may, therefore, be laid down as a maxim, that *a short period of repose, or at least of very light occupation, should be allowed before every meal.*

PROPER KINDS OF FOOD

It has been shown by a reference to the structure of the human intestinal canal, that our food is designed to be a mixture of animal and vegetable substances.

Inquiries with respect to the comparative digestibility of different kinds of food are perhaps chiefly of consequence to those in whom health has already been lost. To the sound and healthy it is comparatively of little consequence what kind of food is taken, provided that some variation is observed, and no excess committed as to quantity. Within the range of fish, flesh, and fowl, there is ample scope for a safe choice. Almost all the familiar aliments, if plainly dressed, will digest in from two to four hours, and prove perfectly healthful. One rule with respect to animal foods is that, the more minute and tender the fibre may be, the more digestible is it. They contain more nutriment in a given bulk than vegetable matters, and hence need a smaller length of intestine to digest them. It is worthy of notice, however, that between the chyle produced from animal and that from vegetable food, no essential distinction can be observed.

Tendon, suet, and oily matters in general, are considerably less digestible than the ordinary fibre; and should be taken sparingly. Pickling, from its effects in hardening the fibre, diminishes the digestibility of meat. Dressed shell-fish, cheese, and some other animal foods are avoided by many as not sufficiently digestible.

Farinaceous foods of all kinds—wheat, oaten, and barley bread, oaten porridge, sago, arrow-root, tapioca, and potatoes—are highly suitable to the human constitution. They generally require under two hours for digestion, or about half the time of a full mixed meal. Green vegetables and fruit, however, softened by dressing, are less digestible, and less healthy as a diet. One important consideration here occurs. There is need for a certain bulk in our ordinary food. Receiving nutriment in a condensed form and in a small space will not serve the purpose. This is because the organs of digestion are calculated for receiving our food nearly in the condition in which nature presents it; namely, in a considerable bulk in proportion to its nutritious properties.

QUANTITY OF FOOD—NUMBER AND TIMES OF MEALS

With respect to the amount of food necessary for health, it is difficult to lay down any rule, as different quantities are safe with different individuals, according to sex, age, activity of life, and some other conditions.

The number and times of meals are other questions as yet undetermined. As the digestion of a meal rarely requires more than four hours, and the waking part of a day is about sixteen, it seems unavoidable that at least three meals be taken, though it may be proper that one, if not two of these, be comparatively light. Breakfast, dinner, and tea as a light meal, may be considered as a safe, if not a very accurate, prescription for the daily food of a healthy person. Certainly four good meals a day is too much.

The interval between rising and breakfast ought not to be great, and no severe exercise or task-work of any kind should be undergone during this interval. There is a general prepossession to the contrary, arising probably from the feeling of freedom and lightness which most people feel at that period of the day, and which seems to them as indicating a preparedness for exertion. But this feeling, perhaps, only arises from a sense of relief from that oppression of food under which much of the rest of the day is spent. It is quite inconsistent with all we know of physiology to suppose that the body is capable of much exertion when the stomach has been for several hours quite empty. Many persons take long walks before breakfast, under the impression that they were doing something extremely favorable to health. Others go through three hours of mental task-work at the same period, believing that they were gaining so much time. But the only observable result is to subtract from the powers of exertion in the middle and latter part of the day. In so far as the practice is contrary to nature, it likewise, of course, produces permanent injury. Only a very short saunter in the open air, or a very brief application to work, can be safely indulged in before breakfast.

With regard to the time for either breakfast or dinner, nothing can be said with scientific authority.

VARIETY OF FOOD

A judicious variation in food is both useful and important. Some aliments, such as bread, can not be varied. But, apart from one or two articles, a certain variation of rotation is much to be desired, and will prove favorable to health. There would be a benefit both from a daily variation of food and eating of more than one dish at a meal, *if moderation were in both cases to be strictly observed,* for the relish to be thus obtained is useful as promotive of the flow of nervous energy to the stomach, exactly in the same manner as cheerfulness is useful. The policy which would make food in any way unpleasant to the taste, is a most mistaken one; for to eat with languor, or against inclination, or with any degree of disgust, is to lose much of the benefit of eating. On the other hand, to cook dishes highly, and provoke appetite by artificial means, are equally reprehensible. Propriety lies in the mean between the two extremes.

REGARDING BEVERAGES

The body containing a vast amount of fluids, which are undergoing a perpetual waste, there is a necessity for an occasional supply of liquor of some kind, as well as of solid food. It remains to be considered what is required in the character or nature of this liquor, to make it serve the end consistently with the preservation of health.

When the digestion is good and the system in full vigor, the bodily energy is easily sustained by nutritious food, and "artificial stimulant *only increases the wasting of the natural strength.*" All physicians concur in representing ardent liquors as unfavorable to the health of the healthy, and, in excess, highly injurious. Even the

specious defence, which has been set up for their use, on the ground that they would not have been given to man if they had not been designed for general use, has been shown to be ill-founded, seeing that *vinous fermentation*, from which they are derived, is not a healthy condition of vegetable matter, but a stage in its progress to decay. Upon the whole, there can be little doubt that these liquors are deleterious in our ordinary healthy condition; and that simple water, toast water, whey, ginger beer, or lemonade, would be preferable (the first being the most natural and the best of all), if we could only consent to deny ourselves further indulgence.

CLEANLINESS

To keep the body in a cleanly condition is the third important requisite for health. This becomes necessary in consequence of a very important process which is constantly going on near and upon the surface of the body.

The process in question is that of *perspiration*. The matter here concerned is a watery secretion produced by glands near the surface of the body, and sent up through the skin by channels imperceptibly minute and wonderfully numerous. From one to two pounds of this secretion is believed to exude through these channels, or *pores*, in the course of twenty-four hours, being in fact the chief form taken by what is called the waste of the system, the remainder passing off by the bowels, kidneys, and lungs. To promote the egress of this fluid is of great consequence to health; for when it is suppressed, disease falls upon some of the other organs concerned in the discharge of waste.

One of the most notable checks which perspiration experiences is that produced by a current of cold air upon the skin, in which case the pores instantly contract and close, and the individual is seized with some ailment either in one of the other organs of waste, whichever is in him the weakest, or in the internal lining of some part of the body, all of which is sympathetic with the condition of the skin. A result of the nature of that last described is usually recognized as a cold or catarrh. We are not at present called on particularly to notice such effects of checked perspiration, but others of a less immediately hurtful or dangerous nature.

The fluid alluded to is composed, besides water, of certain salts and animal matters, which, being solid, do not pass away in vapor, as does the watery part of the compound, but rest on the surface where they have been discharged. There, if not removed by some artificial means, they form a layer of hard stuff, and unavoidably impede the egress of the current perspiration By cleanliness is merely meant the taking proper means to prevent this or any other matter accumulating on the surface, to the production of certain hurtful consequences.

Washing is the best means of attaining this end; and, accordingly, it is well to wash or bathe the body very frequently. Many leave by far the greater part of their bodies unwashed, except, perhaps, on rare occasions, thinking it enough if the parts exposed to common view be in decent trim. If the object of cleaning were solely to preserve fair appearances, this might be sufficient; but the great end, it must be clearly seen, is to keep the skin in a fit state for its peculiar and very important functions. Frequent change of the clothing next to the skin is of course a great aid to cleanliness, and may be esteemed as a substitute for bathing, seeing that the clothes absorb much of the impurities, and, when changed, may be said to carry these off. But still this will not serve the end nearly so well as frequent ablution of the whole person. Any one will be convinced of this who goes into a bath and uses the flesh-brush in cleansing his body. The quantity of scurf and impurity which he will then remove, even from a body which has changes of linen once a day, will surprise him.

MUSCULAR EXERCISE

With regard to bodily exercise, it is to be observed, in the first place, that we have no fewer than four hundred muscles, each designed to serve some particular end in locomotion or in operating upon external objects. A sound state of body depends very much upon each of these muscles being brought into action in proper circumstances and to a suitable extent. There is even a law operating within a certain range, by which each muscle will gain *in strength and soundness* by being brought into a proper degree of activity.

The process of waste and renovation may be said to be always going on in the body, but it does not go on with permanent steadiness unless the muscular system be exercised. Whenever one of the organs is put into exertion, this process becomes active,

and the two operations of which it consists maintain a due proportion to each other. A greater flow of blood and of nervous energy is sent to the organ, and continues as long as it is kept in activity. When one state of action follows close upon another, the renovating part of the process rather exceeds the waste, and an accretion of new substance, as well as an addition of fresh power, takes place. On the contrary, when an organ is little exercised, the process of renovation goes on languidly, and to a smaller extent than that of waste, and the parts consequently become flabby, shrunken, and weak. Even the bones are subject to the same laws. If these be duly exercised in their business of administering to motion, the vessels which pervade them are fed more actively with blood, and they increase in dimensions, solidity, and strength. If they be little exercised, the stimulus required for the supply of blood to them becomes insufficient; imperfect nutrition takes place; and the consequences are debility, softness, and unfitness for their office. Bones may be so much softened by inaction, as to become susceptible of being cut by a knife. In a smaller degree, the same cause will produce languor and bad health.

It is of the utmost importance to observe that the exercise of any particular limb does little besides improving the strength of that limb; and that, in order to increase our general strength, the whole frame must be brought into exercise.

In order, then, to maintain in a sound state the energies which nature has given us, and still more particularly, to increase their amount, *we must exercise them.* If we desire to have a strong limb, we must exercise that limb; if we desire that the whole of our frame should be sound and strong, we must exercise the whole of our frame. It is mainly by these means that health and strength are to be preserved and improved.

RULES FOR EXERCISE

1. In order that exercise may be truly advantageous, the parts must be in a state of sufficient health to endure the exertion. In no case must exercise be carried beyond what the parts are capable of bearing with ease; otherwise a loss of energy, instead of a gain, will be the consequence.

2. Exercise, to be efficacious, even in a healthy subject, must be excited, sustained, and directed by that nervous stimulus which gives the muscles the principal part of their strength, and contributes so much to the nutrition of parts in a state of activity.

3. The waste occasioned by exercise must be duly replaced by food; as, if there be any deficiency in that important requisite, the blood will soon cease to give that invigoration to the parts upon which increased health and strength depend.

KINDS OF BODILY EXERCISE

Exercise is usually considered as of two kinds—active and passive. The active consists in walking, running, leaping, riding, fencing, rowing, skating, swimming, dancing, and various exercises, such as those with the poles, ropes, etc., prescribed in gymnastic institutions. The passive consists in carriage-riding, sailing, friction, swinging, etc.

Walking is perhaps the readiest mode of taking exercise, and the one most extensively resorted to. If it brought the upper part of the body as thoroughly into exertion as the lower, it would be perfect, for it is gentle and safe with nearly all except the much debilitated. To render it the more effectual in the upper part of the body it were well to walk at all times, when convenient, *singly*, and allow the arms and trunk free play. It is best to walk with a companion, or for some definite object, as the flow of nervous energy will be by these means promoted, and the exercise be rendered, as has been already explained, the more serviceable.

Fencing is, of all active exercises, the one that is most commendable, inasmuch as it throws open the chest, and at the same time calls into action the muscles both of the upper and lower extremities. Added to this, it improves very much the carriage of the body; for which reason it may be reckoned a branch of polite education.

Dancing is exhilarating and healthful, and seems to be almost the only active exercise which the despotic laws of fashion permit young ladies to enjoy.

Riding is generally classed among the passive exercises, but in reality it is one which involves much action of the whole frame, and as such is very useful for health. Pursued solitarily, it has the drawback of being somewhat dull; but, when two or three ride in company, a sufficient flow of the nervous energy may be obtained.

The amount of bodily exercise to be taken must vary according to the habits, strength, and general health of the indi-

vidual. It has been said that every person should take at least two hours' exercise in the day, and this may be regarded as a good general rule.

MENTAL EXERCISE

The laws and regulations by which exercise may be serviceable to the physical system hold good also for the mental faculties. The brain is a portion of the animal system, nourished by the same blood, and regulated by the same vital laws, as the muscles, bones, and nerves. As, by disuse, muscle becomes emaciated, bones soften, blood-vessels are obliterated, and nerves lose their natural structure, so, by disuse, the brain falls out of its proper state, and creates misery to its possessor; and as, by over-exertion, the waste of the animal system exceeds the supply, and debility and unsoundness are produced, so, by over-exertion, are the functions of the brain liable to be deranged and destroyed. The processes are physiologically the same, and the effects correspond exactly. The mental powers are also increased in magnitude and energy by a degree of exercise, measured with a just regard to their ordinary health and native or acquired capacities. Corresponding, moreover, to the influence which the mind has in giving the nervous stimulus so useful in bodily exercise, is the dependence of the mind upon the body for supplies of healthy nutriment. And, in like manner with the bodily functions, each mental faculty is only to be strengthened by the exercise of itself in particular.

It should be universally known, that the uses of the intellectual nature are not to be properly realized without a just regard to the laws of that perishable frame with which it is connected; that, in cultivating the mind, we must neither overtask nor undertask the body, neither push it to too great a speed, nor leave it neglected; and that, notwithstanding this intimate connection and mutual dependence, the highest merits on the part of the mind will not compensate for muscles mistreated or soothe a nervous system which severe study has tortured into insanity. It ought to be impressed on all, that to spend more than a moderate number of hours in mental exercise diminishes insensibly the powers of future application, and tends to abbreviate life; that no mental exercise should be attempted immediately after meals, as the processes of thought and of digestion can not be safely prosecuted together; and that, without a due share of exercise to the whole of the mental faculties, there can be no soundness in any, while the whole corporeal system will give way beneath a severe pressure upon any one in particular. These are truths completely established with physiologists, and upon which it is undeniable that a great portion of human happiness depends.

REPOSE DEMANDED BY EXERCISE

Exercise demands occasional periods of repose, and, in particular, that a certain part of every twenty-four hours be spent in sleep. After having been engaged in daily occupations for fourteen or sixteen hours, a general feeling of fatigue is induced; the motions of the body become difficult, the senses confused, the power of volition or will is suspended, and the rest of the mental faculties, becoming more and more inactive, sink at length into a state of unconsciousness. The sense of sight first ceases to act, by the closing of the eyelids; then the senses of taste and smell become dormant; and then those of hearing and touch. The muscles, also, dispose themselves with a certain reference to ease of position, those of the limbs having grown indolent before those that support the head, and those that support the head before those of the trunk. In proportion as these phenomena proceed, the respiration becomes slower and more deep, the circulation diminishes in impetus, the blood proceeds in great quantity toward the head, and all the functions of the internal organs become retarded. In this state, shut out as it were from the external world, the mind still retains its wonted activity, deprived, however, of the guidance of judgment and the power of distinct recollection; in consequence of which, it does not perceive the monstrous incongruities of the imagery which sweeps before it, and takes but faint cognizance of the time which elapses.

It may be laid down as an axiom, that the more uninterrupted sleep is, the more refreshing and salutary will be its effects; for during this period, the body undoubtedly acquires an accession of nervous energy, which restlessness, however induced, must disturb; and therefore the state of the body before going to sleep, the kind of bed, and the manner of clothing require especial attention. As the functions of the body are performed more slowly during our sleeping than our waking hours, a full meal or supper, taken immediately before going to bed, imposes a load on the

stomach which it is not in a condition to digest, and the unpleasant consequence of oppressive and harassing dreams is almost certain to ensue. When the sleeper lies on his back, the heart pressing, while pulsating, on the lungs, gives rise to a sense of intolerable oppression on the chest, which seems to bear down upon the whole body, so that in this painful state not a muscle will obey the impulse of the will, and every effort to move appears to be altogether unavailing. This constitutes *incubus* or *nightmare;* and it may be observed, that, as acidity on the stomach, or indigestion, gives rise to such dreams, so all dreams of this disturbed character are converse indications of indigestion; for which reason the great physiologist Haller considered dreaming to be a symptom of disease.

The kind of bed on which we repose requires attention. Some are advocates for soft, others for hard beds; hence some accustom themselves to featherbeds, others to mattresses. The only difference between a soft and a hard bed is that the weight of the body in a soft bed presses on a larger surface than on a hard bed, and thereby a greater degree of comfort is enjoyed. Parents err in fancying that a very hard bed contributes to harden the constitution of their children; for which reason they lay them down on mattresses, or beds with boarded bottoms. A bed for a young child can not be too soft, provided it does not sink into it in such a manner that the surrounding parts of the bed bend over and cover the body. The too great hardness of beds, says Dr. Darwin, frequently proves injurious to the shape of infants, by causing them to rest on too few parts at a time; it also causes their sleep to be uneasy and unrefreshing. Whatever be the time chosen for sleep, it is evident that no person can with impunity convert day into night. Eight o'clock for children, and eleven for adults, may be recommended as good hours for retiring to rest. It is well known that children require more sleep than adults; and more sleep is requisite in winter than in summer. The average duration of sleep which may be recommended for adults is *eight* hours; but much depends upon habit, and many persons require only six. It is scarcely necessary to observe, that, on rising in the morning, the strictest attention should be paid to washing the face, neck and hands; the mouth and teeth should also be well cleansed. The most simple powder for the teeth is finely brayed charcoal, a little of which will clear away all impurities, and preserve the teeth. On leaving the bedroom, the windows should be opened, and the clothes of the bed turned down, in order that the exhalations of the body during sleep may be dissipated. If, instead of this, the bed be made immediately after we have risen, these exhalations are again folded up with the clothes—a practice which is not consonant either with cleanliness or health.

TEMPERATURE

The fifth important requisite for health is that the body be kept in a temperature suitable to it.

The degree of heat indicated by 60° Fahrenheit, or that of a temperate summer day, is what the human body finds agreeable, when in a state of inactivity.

At all periods of life, it is most desirable to avoid exposure to very low temperatures, especially for any considerable length of time. To sit long in cold schoolrooms, or workrooms, with the whole body, and especially the feet, in a chilled condition, is very unfavorable to the health of young people.

Clothing should be in proportion to the temperature of the climate and the season of the year; and where there are such abrupt transitions from heat to cold as in our country, it is not safe ever to go very thinly clad, as we may in that case be exposed to a sudden chill before we can effect the proper change of dress. The underclothing should be invariably of flannel, which is remarkably well calculated to preserve uniformity of temperature, as well as to produce a healthy irritation in the skin.

Wet clothes applied to any part of the body, when it is in an inactive state, have the instantaneous effect of reducing the temperature, this being an unavoidable effect of the process of evaporation which then takes place. Hence, it is extremely dangerous to sit upon damp ground, or to remain at rest for a single minute with wet feet. Dampness in the dwelling has the same effect, and is equally dangerous. The chill produced by the evaporation from the wetted surface checks the perspiration and sends the blood inward to the vital parts, where it tends to produce inflammatory disease.



GYMNASTICS



GYMNASTICS is a system of exercises which develop and invigorate the body, particularly the muscular system. If properly directed, gymnastics will enlarge and strengthen the various muscles of the trunk, neck, arms, and legs, and will expand the chest so as to facilitate the play of the lungs, will render the joints supple, and will impart to the person grace, ease, and steadiness of carriage, combined with strength, elasticity, and quickness of movement; but an injudicious mode of exercise will frequently confirm and aggravate those physical imperfections for which a remedy is sought, by developing the muscular system unequally.

OUTLINES OF SCIENTIFIC GYMNASTICS

WALKING, RUNNING, JUMPING, ETC.

IN WALKING, the arms should move freely by the side, the head be kept up, the stomach in, the shoulders back, the feet parallel with the ground, and the body resting neither on the toe nor heel, but on the ball of the foot.

IN RUNNING, the legs should not be raised too high; the arms should be nearly still, so that no unnecessary opposition be given to the air by useless motions. In swift running the swing of the arms should be from the shoulder to the elbow, the forearm being kept nearly horizontal with the chest. Running in a circle is excellent exercise, but the direction should be changed occasionally, so that both sides of the ground may be equally worked; as, if the ground be not kept fairly level, the runners will find it difficult to maintain their equilibrium.

JUMPING.—The first rule is, to fall on the toes, and never on the heels. Bend the knees, that the calves of the legs may touch the thighs. Swing the arms forward when taking a spring; break the fall with the hands if necessary; hold the breath, keep the body forward, come to the ground with both feet together, and, in taking the run, let your steps be short, and increase in quickness as you approach the leap.

LEAPING.—*The Long Leap.*—Make a trench, which widens gradually from one end to the other, so that the breadth of the leap may be increased daily. Keep the feet close together, and take your spring from the toes of one foot, which should be quickly drawn up to the other, and they should descend at the same instant; throw the arms and body forward, especially in descending. Take a run of about twenty paces.

The Deep Leap.—This is performed from the top of a wall, or a flight of steps, increasing the depth according to the progress of the pupil. The body should be bent forward, the feet close together, and the hands ready to touch the ground at the same time with, or rather before, the feet.

The High Leap.—This leap can best be taken over a light fence that will give way in the event of its being touched by the feet. It may be taken either standing or with a run: for the former, the legs should be kept together, and the feet and knees raised in a straight direction; for the latter, we recommend a short run, and a light tripping step, gradually quickened as the object to be leaped over is approached. You should be particularly careful not to alight on your heels, but rather on the toes and balls of the feet.

GYMNASTICS WITH APPARATUS

Our apparatus will consist of the following: horizontal bar, hanging bar, parallel bars, vaulting horse, ladder, hanging ropes, and the usual *et ceteras.*

THE HORIZONTAL BAR should be set up as follows: If intended as a permanency, two strong posts must be let into the ground or into iron sockets, standing seven feet

apart and about eight feet in height; these are to support the bar, which must be made to shift up and down in grooves cut in the posts, so as to be easily adapted to the height of the performer. This bar should be of straight-grained ash, seven feet between the uprights, an inch and three-quarters in diameter, perfectly round, with a steel core an inch thick running



Fig. 1.—The Horizontal Bar.

through the centre. This last is a very important point.

If there be no steel core, then the bar must be reduced at least one foot in length and increased to two inches diameter; both of which, especially the latter, as making it clumsy to the grasp of an ordinary hand, will detract much from its practical value.

The bar must be so fastened to the uprights that there shall be no unsteadiness or vibration. A wabbly bar is a terrible nuisance, and is apt to throw one out of all calculation just at the critical point of a feat.

If for private use, or it be thought desirable to make it portable, the method of construction figured in our cut (Fig. 1) will be found very convenient and serviceable, and, what is more, thoroughly trustworthy.

The Hanging Bar must be very carefully constructed. The ropes should be attached securely to a good, firm, unyielding support, about fifteen or eighteen feet from the ground—this will be quite sufficient height—and the bar, which should be about twenty-six inches long by one and a quarter in diameter, with a steel core as before, must be firmly attached to the ropes, so as to afford a safe hold. *Above all things, it must not revolve in the grasp.* The height from the ground must be regulated by the stature of the performer.

Parallel Bars, being intended for the grasp of the hands, must be of such size and shape as will afford the best grasp, and their height and distance apart must be adapted to the stature of those for whose use they are intended.

The *size* of the bars is especially important: if they be too large for a fair grasp, not only is the hand likely to slip and a heavy fall to result, but there is great danger to the wrist and thumb of serious sprains or dislocation. Moreover, when a fair grasp is impossible, many of the exercises—most of them, indeed—are also *ipso facto* impossible, and thus many beginners are disgusted at the outset: they are told to begin with such and such exercises, as simple preliminaries to others more advanced; they find after repeated trials that they can not even make a commencement, and naturally soon give up the whole thing in despair.

For ordinary purposes, that is, for people not of exceptional stature, the most useful dimensions are these: height from the ground, four feet eight inches; distance apart, eighteen inches, or nineteen at most; for boys, seventeen or even sixteen will be sufficient. The length should not be less than seven feet, and the bars should be *round*, and of a diameter of two and an eighth inches.

For the uprights no dimensions need be given: all that is needful is that they should

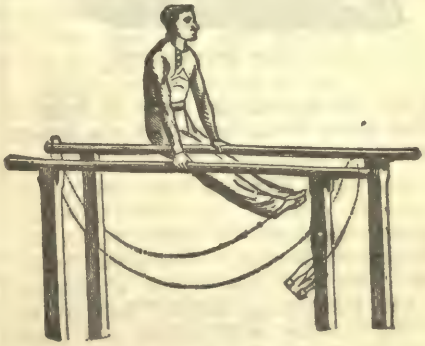


Fig. 2.—The Parallel Bars.

be sufficiently strong. They should be fitted into a stout wooden frame, firmly mortised together. When in use, this frame must be fastened to the floors by screws. If required for a playground, or any place where it is necessary to have them fixed, they may readily be secured by wooden stakes or wedges driven into the ground.

The Vaulting-Horse is of all gymnastic apparatus that which has been hitherto most neglected.

There are various lengths for these horses, but the one you will find to be the most generally useful is six feet long and about sixteen inches across the back. It is covered with cowhide all over and evenly padded, and is generally made with one end a little raised, with a slight bend corresponding to the neck of the animal which is its prototype; and this gives some form to it, and is useful as a mark where to place the hands.

There are two pommels placed about the centre, eighteen inches apart, and movable, so that the horse may be used without them if required; and in this case flush pommels, level with the back of the horse, are inserted into the grooves.

The legs must be made to slide up and down after the manner of a telescope, so

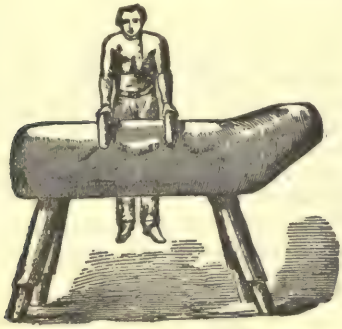


Fig. 3.—The Vaulting-Horse.

that the horse may be used at heights varying from about three feet six inches to six feet.

The Ladders, Hanging Ropes, and so on, we need not describe. There are, however, two more requisites to which we should wish to direct attention. One is the Hand-Rings: two ropes, as if for a hanging bar, but terminating instead each in an iron ring covered with leather, and large enough for the hand to grasp comfortably. These rings are made of various shapes; but that which we recommend as the most practically useful is the *stirrup*.

One other requisite, indispensable for safety in first essays at many of the feats we shall describe, is the Lungers, so called. This is a strong broad leather belt to buckle round the waist, with an iron ring or eye at each side. To these eyes are strongly attached ropes, one on each side, of sufficient strength to support the weight



Fig. 4.—The Lungers.

of the wearer. The figure will indicate the method of using it. (Fig. 4.)

This is an invaluable safeguard for novices, and enables many to learn quickly —simply by the fearlessness it engenders— many a difficult feat which they would otherwise never dream of attempting.

The Horizontal Bar.—So much for the construction of an apparatus; now for the use to be made of it. We will begin with the horizontal bar.

But before we begin it must first be put into *good condition*. Most likely there will be a little grease on it from previous practice, which it is highly important should be removed before commencing. This is done in the following manner: Take a wet cloth (without soap or soda, as any kind of alkali will raise the grain of the wood and make it rough), and rub the bar with it; then get a few feet of rope—thick sash-line is the best—give it one turn round the bar, and taking hold of each end, rub it up and down, gradually moving it from one end to the other. The friction will dry the wood, remove the grease or dirt, and put on a good surface.

The bar being now in good condition, wash your hands perfectly clean, and you are ready to commence. You will find that there is no *resin* required, which every gymnast is compelled to use if the bar is not kept in good order. The use of resin is bad for various reasons: it will dirty your hands, and if you have not practiced much it will cause blisters sooner than otherwise. Sometimes the skin even of hard hands is torn, and wounds ensue, preventing further practice for some time. But if you are obliged to use resin, do it judiciously: powder a little, and rub only the *tips* of the fingers in it; avoid, above all things, getting it into the palm of the

hands, as it will make them stick to the bar, and it is also very likely to cause jerks in swinging, and the grip will not be so certain as when the hands move smoothly round. These details may appear rather tedious, but you will find them useful, as they apply to all apparatus where the wood is handled.

Now, there is another thing you must bear in mind, and that is the way in which you must take hold of the bar.

Some say that you should take hold of it as you would a handle, with the thumb underneath; but we think there is no doubt that the proper way is the same as that in which a monkey holds the branch of a tree—the thumb on the same side as the fingers. If the thumb be underneath, in all ordinary swinging exercises it has a tendency to draw the fingers off; although in some few slow movements it may be under, yet, as a rule, it is better above.

Jump up at the bar, and hang with the hands, the body, arms, and legs perfectly straight, and the feet close together.

Now, having hold of the bar with both hands, draw yourself up until the chin is above the bar; then lower the body until the arms are quite straight again.

Practice this exercise as often as you can without tiring, or until you can perform it six or eight times in succession, which you will not do until you have practiced for some little time.

Beginners must now try a few gentle exercises, such as hanging by each hand alternately, the other close to the side.

Then begin to walk along the bar by the hands, taking alternate steps with them, making the steps as equal as possible, and keeping, as we said before, the legs hanging quietly down. Go in this manner from



FIG. 5.



FIG. 6.

one end to the other, then reverse the hands, and back again.

Now draw yourself up, with your chin above the bar, as in Fig. 5, and repeat the walk in this position.

Next try a few good swings backward and forward at arm's-length: you will find that you will swing further each time, until you can swing your body almost into a horizontal position.

All these little exercises should be repeated as often as possible; they help to strengthen the muscles, and accustom the hands to the feel of the bar.

TO GET ON THE BAR.—Draw yourself up as in the last figure (Fig. 5), then suddenly drop the whole of the right side, raising at the same time the left leg and throwing it over the bar, as in Fig. 6. Now establish a good swing with the right leg, and you will bring your body well over the bar, when a sudden exertion of muscle will bring you sitting in the attitude of Fig. 7. This is by no means an



FIG. 7.



FIG. 8.

easy thing to do at first; but persevere, and, after a few failures, you will suddenly find you have succeeded: once accomplished, it will come easy enough.

At first you will find it hard matter enough to get your legs up to the bar at all. Beginners mostly try to lift the toes without bending the knees, and, of course, find it beyond their powers. Bring your knees up to your chin, doubling your feet well into your body, and you will find it come easy enough.

There is another method of getting on to the bar, by bringing the leg up through the hands, and with one good swing bringing yourself roundly up.

You may try either of these methods, yet nothing but continued practice will enable you to master them; still, when you shall have mastered them, and can get on to the bar in a respectable manner, you may consider you are making some progress.

THE LEG-SWING.—Being in your original position, as in Fig. 7, throw your right leg as far behind you as possible, at the same time slipping the other leg back-

ward, and catching by the bend of the knee, as in Fig. 8. Then throw the head back with a good swing (keeping the arms straight), and you will thus make one turn backward round the bar.

You will find at first you are apt to make a half-turn too much; but after a little practice you will be able to regulate the first swing so as to go round once, and come up into your first position with a good balance.

Next try two or three turns without stopping; but always endeavor to finish *above* the bar, as at starting. It is bad to stop as in Fig. 9, as you are disabled for the next exercise.

For the forward swing, reverse the hands, keeping the whole weight of the body on



Fig. 9.



Fig. 10.



Fig. 11.

the arms, throw the head well to the front, and with one plunge forward—keeping tight hold with the hands, and the body erect, as in Fig. 10—you will make one forward revolution round the bar.

After some practice, you will be able to go round several times without stopping.

This exercise is actually easier than the former, but it requires more confidence, for the want of which you are apt to keep too close to the bar, and thus you do not get sufficient swing to bring you up again.

Practice both these exercises with right and left legs alternately.

Sitting on the Bar.—Having accomplished the backward leg-swing, we will now proceed to something a little more difficult.

You will now get on to the bar as in Fig. 7, with leg over; now try to balance yourself in this position without holding by your hands; having succeeded, take hold of the bar with both hands behind you, and pass the hanging leg over the bar into a sitting position, as in Fig. 11.

Now practice a few different balances while sitting; that is, with the bar under different parts of the thigh.

Try to sit almost straight, and again with



Fig. 12.



Fig. 13.

the bar just within the angle of the knee. This must be done without touching the bar with the hands.

The Sit-Swing.—This is so called from its being a swing performed while sitting on the bar, and we will commence with the backward swing.

The "sit-swing" is somewhat similar to the leg-swing, but, of course, more difficult, as in the latter the weight of the body is mostly on the leg; but in the present exercise the whole weight is thrown upon the arms, therefore requiring more strength.

While sitting on the bar, as in the last figure, but holding with the hands, straighten the arms, and let them support a great part of the weight of the body; now throw yourself backward with a good swing, still keeping a firm hold of the bar with both hands.

Now, the object of this movement is to go quite round the bar in the swing, and thus make one complete revolution, which is called the "sit-swing backward"; but of course no one can expect to accomplish this feat at once.

The first few times you attempt it, you will most likely find yourself hanging with the weight of the body beneath the bar, and with the momentum of the swing gone.

In this case, all you can do is to let your legs pass through your arms, and thus drop on to the ground; but you must repeat the movement until you are able to swing quite round.

The way to practice this is, to swing about three-quarters round, and then to come back into the sitting posture again. This will give you confidence, and after a time you will feel yourself able to go all the way round, and to come up into your original position.

For some time you will find that you will come up in rather an awkward manner, without having swing enough to bal-

ance yourself, and therefore you will fall forward again; in which case you must be prepared to let go with the hands, and to throw yourself off the bar on to your feet; or, what is much better, to have some one standing in front, in readiness to catch you as you come off.

In the forward sit-swing, the first start is the principal thing, as the impetus gained will be sufficient to bring you up again. In order to get a good start, you must raise the body as far away from the bar as possible, supporting the whole weight on the arms, as in Fig. 14; now throw the chest out and the head back, with the legs rather straight, then, with a good plunge forward, keeping the arms straight as in Fig. 15, you will go quite round; that is to say, you will in time, for you must not think of succeeding at first in any of these feats, but perseverance will soon enable you to accomplish them.

You will find in practicing this exercise,



FIG. 14.



FIG. 15.

that some of your strength will be expended in getting on to the bar again after each failure. We will now show you a very good way of getting into the sitting position again, while hanging, as in Fig. 9. Straighten the body as in Fig. 15, and draw your centre of gravity a little above the bar, then, bending the body again slightly, you will roll quite over so as to come into a sitting position again. This movement is called the "Plymouth."

HANGING BY THE LEGS.—Get on to the bar in a sitting position, and then throw yourself off backward, as for a sit-swing; but, instead of going round, drop the body and bend your knees, and thus let them catch on the bar, getting a firm grip with them, at the same time letting go your hands as in Fig. 16.

A young beginner should practice this on a low bar, so that, when he hangs by the legs, his hands will touch the ground; and thus, when he is getting tired and can not raise himself, he may let his legs drop, and come on to his hands on the floor safely. He may then get on to the bar again, hanging by the knees as before, and practice swinging backward and forward

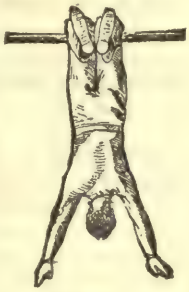


FIG. 16.

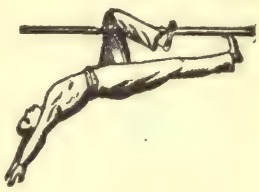


FIG. 17.

as high as he can. At first the friction will make the legs a little sore, but the muscles will soon harden with practice.

There are a few other leg exercises which may be practiced with advantage, and which will afford variety, and also help to bring all the muscles into play.

One of these is shown in Fig. 17, where you hang on the bar with one leg, stretching the other straight out with the toe against the under side of the bar, and the exercise is to bend the body up and down. This should be done with right and left legs alternately.

A performance which is also very showy (although we should not advise any one to attempt it without very good nerve and also strength in the legs), is the standing balance on the bar.

This may be practiced on a bar as low as you like, so that you can easily jump



FIG. 18.



FIG. 19.

off; but of course it looks better on a bar of ordinary height.

While sitting on the bar, lift one foot and gradually bring it on to the bar, as in Fig. 18, and then raise yourself up standing, as in Fig. 19, a feat which, of course,

requires great strength in the legs, and a good command of balancing power. Now endeavor to walk forward and backward by shifting the feet; and if you lose your balance, jump off the bar altogether, without trying to recover it, and get up again.

VAULTING OVER THE BAR is a very useful exercise, and quite as well performed on the horizontal bar as on the vaulting-horse, if your choice of apparatus should be limited.

Try it first on a bar about three feet six inches from the ground, and gradually raise it; but take care not to overtask your powers by having it too high for you, as very often, when young gymnasts find that they are getting on respectably, they are very apt to be too ambitious, and to attempt heights far beyond their powers. About four feet six inches is a fair height for a person about five feet four or five to begin with. Learn to clear this clean and in correct style, before you attempt anything higher.

As vaulting is by no means a difficult feat, to look well it should be done in



FIG. 20.

good style. To make a clean vault, the body should be kept as straight and as far away from the bar as possible (see Fig. 20), and should be practiced right and left alike.

No careful gymnast need ever be afraid of injury if he uses his brain as well as his body, and you will find that, if a mishap occurs, it is generally to some one who attempts exercises without taking into consideration in what different positions he may come off the apparatus; but all these exercises may be gone through safely if sufficient precautions are taken at first.

THE PARALLEL BARS.—You may commence with the parallel bars, as in the horizontal bar, with the simple movements which any one would naturally perform upon them; such as standing between them, and with a spring placing a hand upon each, and thus supporting the weight of the body.

When you have become somewhat used to them in this way, commence swinging backward and forward, with the legs straight down, trying to go higher each time.

Of course, if you have practiced on the horizontal bar, the preliminary exercises will be mastered at once; but as it is possible that some may commence on the parallels, we give this short description of these simple movements.

The first exercise after you are on the bars should be

THE WALK.—This is very simple, being performed by jumping up and placing one hand on each bar, with the body hanging suspended between them as before.

Now walk along the bar by taking steps with the arms, making them as evenly and regularly as you can, keeping the head well up, and the body perfectly straight.

Walk in this way from one end to the other, and when you can do this easily, walk back in the same way, without turning round. Then let the body sink down as in Fig. 21, and hop from one end to the other backward and forward. This you will find capital practice for the muscles of the arms, although rather tiring at first.

When this hopping movement is done with a good swing, so as to go forward or backward some considerable distance, it has a very good effect, and is called "The Grasshopper."

VAULTING MOVEMENTS are performed by getting up between the bars as for the walk, placing yourself near the centre of the bars.

Now swing backward and forward until you are able to throw both legs over one



FIG. 21.



FIG. 22.

side of the bars in front of you, as in Fig. 22.

Now with another swing bring them back again, and throw them over behind you on the same side as before. (Fig. 23.)

All these exercises should be performed with the body as straight as possible, and when done neatly, with the legs close together, have a very pretty effect, and are very good practice.

There are several similar movements, such as those represented in Figs. 25 and 26, which are done by first swinging backward and forward, and then throwing the legs over the outside of the bars in front, one on each side; then bending back a little, and bringing the legs over back again between the bars, and then, without stopping, throwing them over again behind you, one on each side as before. This you should practice until you can repeat it several times without stopping.

The next exercises are good practice.



FIG. 23.



FIG. 24.

Stand between the bars, and place the hands on the under side of them, even with the shoulders, then gradually raise the legs until they turn over and bring the body into an inverted position, as in Fig. 27; then continue the movement right over, until you are hanging as in the position shown in Fig. 28.

You should practice this until you can do it several times without touching the ground with the feet, and you will find it very good practice for the front and



FIG. 25.



FIG. 26.

back horizontal movements, previously shown on the horizontal bar.

THE PUMPING MOVEMENT is one of the finest exercises for developing the muscles of the chest. You must first practice the swing until you can bring yourself up horizontally, as shown in Fig. 29; then, by bending the arms, drop the body into Fig. 30, and then swing round, your feet

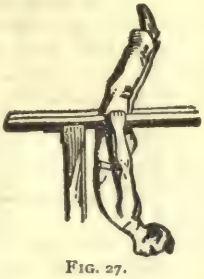


FIG. 27.



FIG. 28.

describing a semicircle, and come up again into Fig. 31, finishing the movement by swinging backward again in the same manner into Fig. 29, as on commencing the movement.

THE VAULTING HORSE.—There are no simple preliminary exercises on the horse but what may be just as well performed on the parallels; and, indeed, such is the similarity in some of them that we have invariably noticed that any gymnast who is good on the one is not likely to be a novice on the other.

For this reason we shall endeavor to make as much variety as possible, and

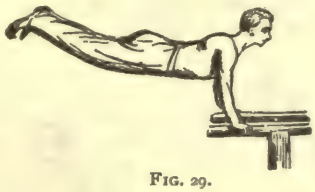


FIG. 29.

shall therefore not describe exercises which may be as well gone through upon the parallels, but only give those which have a distinctive character.

Commence by jumping on to the horse, with the hands one on each of the pommels, and supporting the whole weight of the body; the legs hanging straight down.

Now bring one leg over the body of the horse in between the pommels, as in Fig. 32; then bring it back again without touching the horse with the foot, and pass the other leg through in the same manner.

Now try and change the legs simultaneously; that is, while the one is being brought back, pass the other through forward; the body, of course, still supported by the arms.

THE LEG-SPRING is the next exercise, and is performed in the following manner:

Get on to the horse as in Fig. 3, and then bring both legs up on to the back in a kneeling position, as in Fig. 33; then, while the body is thus gathered, give a good spring up, throwing up the arms as in Fig. 34, and you will come over to the other side on to your feet on the ground.

If you are nervous in attempting this at first, get the assistance of some one to hold your hand, and you will accomplish it without much difficulty.

The next exercise must be practiced at first with the horse as low as possible, and



FIG. 30.

the jumping-board placed about a foot from the horse.

JUMPING THROUGH THE HANDS.—Take a short run, and jump on to the board with both feet down at once, flat-footed. Place your hands one on each pommel, spring up, and pass the legs through the hands, as in Fig. 35, shooting them out in front of you over the horse, so as to come neatly down on the other side. Of course you must measure your distance, so that you



FIG. 31.



FIG. 32.

may rise high enough while passing over for the back to clear the top of the horse.

Another form of this exercise is to jump over the horse with the legs *outside* the hands, and is performed in a similar manner to the last, but is rather more difficult, as you will need a much greater spring to raise yourself sufficiently high to pass clear over; and you must also take care to let go with the hands at the proper moment, when in the position shown in Fig. 36.

If you retain your hold of the pommels



FIG. 33.



FIG. 34.

too long, you will lose command of yourself, and they will have a tendency to pull you back and cause you to pitch head first on to the ground; but when you commence to practice this movement, it is necessary to have some one standing in front, to catch you in case your feet do not quite clear the top of the horse, more especially if it should be at all too high for you.

SADDLE VAULTING.—Get on to the horse



FIG. 35.



FIG. 36.

as in Fig. 37, sitting across as in a saddle, but *behind* the pommels; then, bearing the whole weight upon the arms, throw your legs right up, and, giving yourself a kind of twist, describe a semicircle with them, and bring yourself round with the face the other way; your hands being one upon each pommel, your course will naturally be toward the one which holds the aftermost.

THE LONG FLY is a very fine exercise



FIG. 37.

for the whole of the body, and more especially the lower extremities.

You commence practice for this move-

ment by placing the jumping-board about three feet from the largest end of the horse, then with a run, pitch with your hands on to the end, as in Fig. 38.

Now move the board a little further off, and repeat the movement; and thus continue the exercise, increasing the distance each time, until you can pitch on to the end from about five or six feet.

Now vary this movement by jumping from different distances, and pitching on the hands first, and then bringing up the feet on to the back of the horse, as in Fig. 39.

. And when you are in this position, pitch



FIG. 38.



FIG. 39

with the hands on to the extreme end of the horse, and go over as at "leapfrog."

Having now sufficiently practiced these preliminaries, place the board about a foot from the end of the horse (having first had the high pommels taken out, and the flush ones substituted).

Now take a run and jump, pitching with

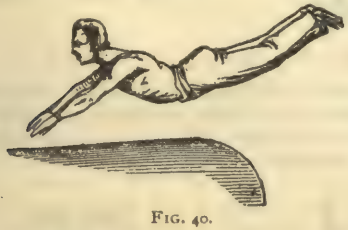


FIG. 40.

your hands on the first pommel, landing yourself astride, as near the middle of the horse as possible; repeat this exercise, gradually increasing the jump, until at last you clear the whole length, as in Fig. 40, coming down safely on the ground in front of the horse.

When you can get near the neck and are likely to come right over in a few more trials, have some one standing in front to catch you in case you do not quite clear the end, and come instead into a sitting position on the neck of the horse, as in this case the sudden stop is likely to throw you over head forward in a rather ignominious manner; but if you practice assiduously, when you feel that you can



FIG. 41.



FIG. 42.

do it, and make up your mind for it, you are almost certain to clear it.

It will, of course, take some time to master this thoroughly; but it is a fine dashing feat, well worth the trouble of acquiring. Only don't think you are doing it if you are satisfied to pitch short and paddle along on your hands for the rest



FIG. 43.

of the distance; you ought to pitch clear over at one movement. If horses of various lengths are available, they will prove of immense service in practicing this exercise.

HANGING RINGS.—These are very useful for developing the muscles of the arms and shoulders. We have, therefore, found room for a few exercises upon them as a guide to the young gymnast, who will find little difficulty in supplementing our instructions with exercises of his own.

Commence by drawing yourself up, as

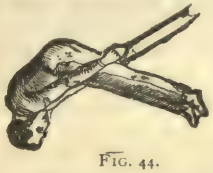


FIG. 44.

in Fig. 41, holding one ring at arm's-length, and the other close to the body.

Draw in the outstretched arm and straighten the other, and repeat this as

often as you like, as it is very good preliminary exercise for the trapeze.

Now, from this position gradually spread the arms wide apart, suspending the body between them, as in Fig. 42, and then let the body gradually sink down until you hang straight down by the arms again.

There are many other strength movements on the hand-rings, but you will soon find them out for yourself; we will, therefore, pass on to the swinging exercises.

Commence swinging simply backward and forward, increasing your momentum



Fig. 45.

by drawing yourself up by contracting the arms as you ascend, and when at the highest, lowering your body with a drop, and by this means you will swing higher each time, until you are able to bring your arms and legs straight and nearly into a horizontal position, as in Fig. 43.

Also swing in different positions in order to get command of yourself while swinging.

Practice by drawing the legs over the

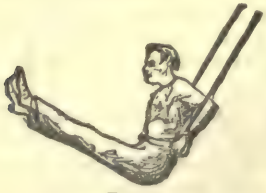


Fig. 46.

head when at the end of the swing, as in Fig. 44, passing back in this position to the other end, and then bringing the legs smartly over, and shooting them straight out (in order to preserve the momentum), and coming back all straight again to the starting point. Repeat this several times, and you will find it very good work for the muscles.

Also swing with the hands close to the groin, and the arms nearly straight by the side, and supporting the body, as in Fig. 45; keeping yourself from pitching your head and shoulders too much forward, at the end of the swing, by bending the arms and projecting the legs, as in Fig. 46, which represents the bent position which you assume when beginning to descend.



Fig. 47.

Another variety of this swing is shown in Fig. 47, where the body is kept horizontal throughout.

CLIMBING LADDERS, ROPES, ETC.

Climbing the rope is a very useful exercise, which should be practiced by every one, as it may often be the means of saving life in case of fire or shipwreck, etc.



Fig. 48.



Fig. 49.

We mean climbing by the use of both legs and arms. Fig. 48 shows the way of taking hold of the rope, and Fig. 49 the position when climbing.



Fig. 50.



Fig. 51.

At gymnastic festivals, some of the competitors have ascended on a rope in this

way to the height of upward of one hundred feet.

Another method is by holding on and raising yourself by using the hands only, but this is more difficult.

Another exercise is by climbing the knotted rope, and also one with short crossbars fixed at frequent intervals.

Climbing the pole, either fixed or hanging, as in Fig. 50, only varies from the same exercise on the rope by its being rather more difficult to grasp, from being thicker and also rigid.

Climbing ladders, fixed both in vertical and horizontal positions, and at various angles, furnishes a good variety of exercise for the arms, and is very easy to commence with. Fig. 51 shows an exercise on the horizontal ladder, in which you hold by the outside, and progress by moving the hands forward alternately. Fig. 52 represents another movement, in which you walk along under the ladder, increasing the length of the step by holding the rounds at some distance apart, the intervening ones being passed. Fig. 53 shows one of the movements upon the perpendicular ladder, in which the object is to keep the arms and legs as straight as possible while the steps are taken. Fig. 54 is the oblique ladder, which may be practiced by moving both up and down by the hands.



Fig. 52.



Fig. 53.

It is hardly necessary to say that there are some simple rules to be observed in practicing.

(1.) Never overtire yourself by practice, as that will do more harm than good. (2.)



Fig. 54.

Be careful not to get into a heat without having a wrapper handy to put on when you leave off; and do not practice after a full meal. (3.) Dress must also be suitable, as it is highly important to have all the limbs free and unfettered; and therefore light and loose garments and gymnastic shoes should be worn. A belt may be used by those who require it, but it is not indispensable.

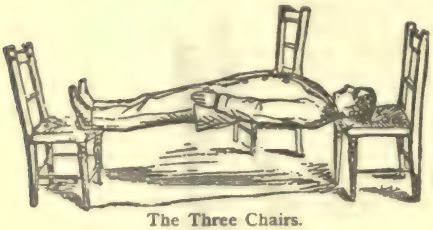
GYMNASTICS WITHOUT APPARATUS

The Three Chairs.—Even should the young gymnast be without any apparatus, he can train his body in various ways, so that when he obtains apparatus, its work will be half done. For example, he may practice the "Three Chairs" exercise, which will strengthen the loins immensely; that being just the portion of the body that is least exercised in the artificial life of the present day.

The young gymnast should take three chairs, and set them in a row, the two endmost chairs facing each other, and the central one set sidewise. They should be just so far apart that the back of the head and the heels rest on the two endmost chairs, and that the central chair supports the middle of the body.

Now curve the body a little upward, so as to take its weight off the centre chair; take the chair with the right hand, draw it from under you, pass it over you to the other side, and with the left hand replace it under your body. This should be done several times, so as to pass the chair from side to side.

The easiest way of learning this really useful exercise is to begin by putting the head and nape of the neck on one chair, and allowing the feet to reach nearly to the



The Three Chairs.

middle of the other. This will greatly take off from the difficulty; and as you feel yourself getting stronger, move the chairs gradually apart, so that at last you lie exactly as shown in the illustration.

Kicking the Cork.—This is a capital exercise, and has the advantage of being exceedingly amusing. Draw two lines on the ground (like a ⊥ reversed), one at right angles to the other. Place your right foot with the heel just touching the cross-line of the ⊥, and the foot pointing along the upright line. Next, put your left foot in front of the right, with the heel just touching its toe, and then place the right foot in advance of left in a similar manner. You will thus make three short steps, each the exact length of your foot.

Exactly in front of the advanced foot, stand a common wine cork upright.

Now, go back to the cross-line, place your left heel against it as before, and with the right foot try to kick down the cork, as shown in the illustration, without losing



Kicking the Cork.

the balance of the body or allowing the left foot to touch the ground. At first it will be found utterly impossible to do so, the toe not reaching to within an inch of it; but a little practice will enable the young gymnast to perform the feat without very much difficulty. The best plan is to reach forward until you judge that your foot is close to the cork, and then, with a slight sidewise kick, strike at the cork, and bring yourself again to the upright position.

This exercise is exceedingly valuable for strengthening the legs and giving pliability to the whole body.

The Stooping Stretch.—This exercise does for the arms what the preceding does for the legs. Take the same lines as before, and stand with both toes on the cross-line. Now throw yourself forward on your hands, and with the right hand make a chalk-mark on the floor as far as you can stretch. Having done this, spring up to the upright position by means of the left arm, taking care not to move the toes from the cross-line. Each competitor at this exercise tries to chalk his mark as far as possible.

When this exercise is first attempted, it seems utterly impossible to reach to any



The Stooping Stretch.

distance, the spring of the left arm being found insufficient to bring the body upright again. After a time, however, when the muscles of the arms become strengthened, the player finds that he can rapidly extend the length of stretch, until at last he can throw himself nearly flat on the ground, and yet spring up again.

In order to strengthen both arms equally, they should be used alternately.

One secret in performing this exercise is to chalk the mark and spring back as quickly as possible, as every second of time takes away the strength of the supporting arm.

Stilts.—There are various forms of stilts and modes of using them. Some, such as those which are employed by professionals, are strapped to the ankles and have no handles. These should not be tried until the young gymnast is skilled with the handle-stilts, as a fall is really dangerous.

Others have long handles, and the feet are received into leathern loops nailed on the stilt; but by far the best are those which, like the stilts represented in the il-

lustration, are furnished merely with two wooden projections on which the feet can rest.

The easiest way of getting on the stilts is to stand with the back against the wall,



Stilts.

and take the handles of the stilts under the arms, as shown in the illustration. Then place the right foot on the step of one stilt, raise yourself, with your back still leaning against the wall, and then place the left foot on the step of the other stilt.

Now try to walk, raising each stilt alternately with the hands, and lifting the foot with it. A very short time will get you into the way of doing this, and in a few days you ought to be able to walk with freedom.

Having obtained some degree of proficiency, you should race with other stilt-walkers, ascend and descend steps, planks, or stairs, pirouette on one stilt holding the other above your head and then replace the feet without coming to the ground, and perform similar feats. Accomplished stilt-walkers can even ascend and descend ladders laid at a considerable slope.

The height of the feet from the ground rather diminishes than adds to the difficulty of walking on stilts. If the stilt-walker should feel himself losing his balance, he should at once jump to the ground, and not run the risk of damaging himself by trying to recover his balance. After some little skill has been attained, the young athlete ought to be able to get on his stilts without needing the support of the wall, a short run and a spring being quite enough for the purpose.

THE WALL-SPRING.—A very good preliminary exercise is that which is called the "wall-spring." The young gymnast stands at some little distance from a wall, places his right hand behind his back, and throws himself against the wall, supporting himself by the left hand. He then springs back to the upright position without moving his toes from the spot on which they had been placed. This, like all similar exercises, should be done with both arms alternately, and the gymnast should learn to throw the strength of all his body, as well as of the arms, into the spring.

An explanation of the Japanese system of athletics, which combines with it the most formidable principles of self-defence, will be found further on in this book.



The Wall Spring.

We earnestly recommend every reader who wishes not only to gain strength and physical poise, but to acquire the knack of protecting himself against enemies of greater size and strength, to study carefully the exposition of the elements of jiu-jitsu.

RIDING

ACCORDING to some authorities, the art of riding had best be and familiarity. Others hold that it is far easier to teach those learned in early childhood, in order to give the necessary ease who begin later, since there are then no bad habits to be overcome. In either case, however, the requisite confidence and readiness at meeting difficulties and managing the horse can only be acquired by constant practice and careful training; so that the whole question is one of the competency of the teacher and the intelligence of the learner. In the following treatise the essential points are set forth with sufficient clearness to enable one to readily understand what is to be learned; so that, when beginning practical training, he knows what he is expected to do.

The whole secret of a correct position on the horse has been summed up in the following stanza:

"Your head and your heart keep boldly up;
Your hands and your heels keep down;
Your legs keep close to your horse's side;
And your elbows keep close to your own."

—CHEFNEY'S *Secret of Riding*

THE ESSENTIALS OF CORRECT RIDING

MOUNTING.—When about to mount, stand before the left shoulder of the horse, hold the whip in the left hand with the lash downward, leave the curb-rein loose on the neck, and take the snaffle-reins at their centre, between the thumb and forefinger of the right hand, with which draw them up evenly between the fore and third fingers of the left hand (the middle or longest finger dividing them), until they are sufficiently tightened for you to feel the bearing of the horse's mouth. Throw the loose ends over the middle joint of the forefinger, so as to drop down on the off-side of the horse's neck. Then take the centre of the curb-reins between the thumb and forefinger of the right hand, as already described, and allowing them to hang more slackened than the snaffle-reins, separate them with the little finger of the left hand, passing the loose ends up the palm, and casting them to the off-side over the ends of the snaffle-reins. Take with the right hand a lock of the mane, and wind it once or twice round the left thumb, closing the hand so as firmly to grasp the reins and mane. The left hand may now be rested on the neck of the horse near to the withers, and within about six or eight inches of the pommel of the saddle. With the right hand, hold the stirrup until the left foot is placed in it; the right hand should now be put on the cantle, the body raised until the feet are side by side, and both knees press the saddle; move the right hand from the cantle to the pommel, and throw the right leg quickly, but not hastily, or with a jerk, across the horse, and sink easily (no jerking or bumping) into the saddle. By turning the toe of the boot slightly inward so as to strike the right stirrup gently, the movement will cause it to swing partly round; by this means the foot obtains possession of it without the aid of the hand,

which should never be employed when the stirrups are lost; after a little practice the stirrups may be dropped even when galloping, and quickly regained by striking both toes simultaneously inward.

Get into the habit of making your horse stand steady during and immediately after mounting. When an animal has been in careless hands, he not infrequently tries to move off immediately he feels your weight on the stirrup. This is not only an unpleasant but also a dangerous proceeding, especially when a lady is mounting. It may be checked by keeping the reins tight, and, if necessary, using the curb-rein. The horse is so docile an animal, though a creature of habit, that it can easily be taught what is required or cured of its defects, provided only that its master is patient and intelligent. Thus, when mounted,

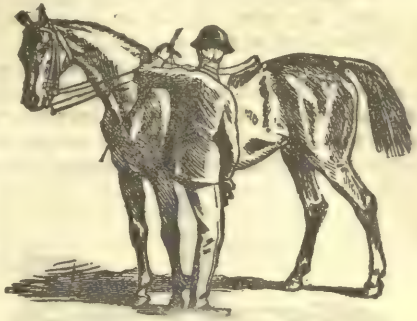


A Horse Harnessed for Riding

instead of immediately starting off at a trot or walk, wait a few seconds, and thus teach your horse that he is not to rush away immediately he feels your weight in the saddle.

In order to discover the proper length for your stirrups, sit comfortably down on your saddle, keep the body upright, let the legs hang loosely at first, then clasp the horse slightly with them, turn the toe in and rather up; then the stirrup ought just to support the foot. Then stand up in the stirrups with the legs straight, and see whether the fork will clear the pommel of the saddle; it ought just to do so if the stirrups are the correct length. Having once ascertained what is the correct length for the stirrups, you should measure from finger-tip to armpit the length from the buckle to the end of the stirrups, and thus you can always on future occasions tell whether any alterations are required before mounting.

Being now seated on the horse, which we will suppose is a quiet, well-trained animal, it would be advisable that a groom



Mounting

or some friend should lead the horse for a time, in order that you may get accustomed to the motion of the horse and to sitting in the saddle.

The seat in the saddle should be obtained by sitting *well down*, leaning rather backward than forward, and grasping the horse with a tolerably firm grip of both legs. There are two seats to be avoided, but which nearly all beginners at first practice: one is leaning forward as if in readiness to go over the horse's head; the other is sitting on the saddle as though it were red-hot. The very best method of getting "shaken down in the saddle," as the term is, is to quit the stirrups—that is, take the feet out of them—and trot round and round a circle. This can be easily done by having a rope attached to a head-collar on the horse, and getting this rope held by an attendant. After a few days of this



A Good Seat

kind of bumping, you learn how to grasp with the legs, so that you scarcely move from the saddle, and you do not then

adopt the dangerous and unsightly practice of depending mainly on the stirrups for your equilibrium.

During the time you are "jogging" in the trot, the reins should be held one in each hand, and so that you "feel" gently the horse's mouth. At no time should the reins become slack, but a uniform "feel" should be maintained. A horse soon becomes accustomed to the hand of its rider, and learns to obey the slightest change. Many



Position in Riding

horses, especially those gifted with tender mouths, will become restive, or will rear, attempt to run away, etc., when their riders either suddenly slacken, then tighten the reins, or in other ways alter their hold upon them.

THE TROT.—Having passed through the process of being shaken down in the saddle, we may then take our stirrups and learn how to sit down in the saddle, keep our stirrups, and yet not to rise in them when the horse trots; after which we may practice rising to the trot. There is scarcely a more ridiculous exhibition than that of a rider working laboriously to rise to his horse's trot, using much more exertion than the animal he bestrides, while he works his arms and body as though riding were a very painful matter. The very slightest movement of the instep and a spring from the knee is sufficient to prevent the bumping produced by a horse's trot; and the skill or awkwardness of a rider is never more prominent than when his horse is indulged in a long slashing trot.

THE CANTER.—To "raise a horse into a canter" from a trot, we should slightly pull the left rein, at the same time closing the legs. By a steady hand on the reins we may increase or decrease the speed of the horse, or again reduce his pace to a trot.

Nothing but practice and instruction will ever give a rider a good firm seat on a horse; but at the same time, practice alone may produce a strong seat but a very awkward one, unless the defects of the seat are pointed out early.

VICES AND THEIR TREATMENT.—Having attained a certain amount of skill in sitting on a horse and in handling the reins, the horseman may devote his attention to certain matters which are not unlikely to happen to every equestrian performer. These may be classed under the head of the vices of the horse, and are principally as follows: running away, shying, rearing, bucking, and refusing to move; kicking, biting, and stumbling.

RUNNING AWAY.—A runaway horse is a most dangerous animal, and for an unskilled rider to keep such a creature is not advisable. Many so-called runaway horses, however, are merely high-spirited animals whose former riders were unable to manage them. As an example: we possessed for three years a horse which we regularly hunted, and on which we placed a lady, and which had been sold because he was a determined runaway. Only once did this horse run away with us, and that was in consequence of the reins breaking. That horses do run away, however, is a fact; and we will now consider the best means of dealing with this vice.

A runaway horse is usually one with a very hard mouth, which is unaffected by



Position on a Run

any amount of pulling applied merely as a dead pull. A horse is stronger than a man, and therefore to pull against him is useless.

A particular kind of "bit" is requisite for a runaway horse; the best that we have found being a powerful "Pelham." The reins should be very stout, so as to afford a firm grasp, with no fear of breaking. Stout strong reins also do not slip through the fingers as do those which are thin.

We will now suppose that a rider is

seated on a horse, and starts for a canter on a nice bit of turf. His horse, probably fresh, bounds off, and the rider soon finds the animal pays no attention to his "Whoa, whoa," or to the pull at the reins. A bad rider has at this point come to the end of his expedients, and usually does nothing more than give a dead pull at the reins until he gets cramp in his arms and fingers, and is unable to use them effectively, when he is at the mercy of his horse. Some riders vary the "dead pull" by sawing their horses' mouths by alternately pulling the right and left rein. This sometimes, but rarely, has the effect of stopping a horse; the common result being that the animal throws up its head, changes its feet in the gallop, but still goes on, probably with a temper not improved by the fact of



An Awkward Position on a Run

its mouth bleeding in consequence of this ill treatment.

As an effectual method for pulling up a runaway horse we have never found any equal to the following:

The reins being very strong, and the bit a "Pelham," or one which will not slip through a horse's mouth, we gather the reins short up in the left hand, so short that the hand is pressed against the horse's mane; then pass the right hand down the right rein until it grasps this rein within a few inches of the bit; with a firm hold pull this round toward the right knee, taking care that the horse does not snatch the rein out of your hand, as he will try to do if he be an accomplished runaway. When the horse's head is thus pulled round he can not gallop, nor can he do more than twist round. We have by this method the advantage of a lever pulling round the horse's head with enormous power.

Against this plan it has been urged that we are very likely to throw a horse down. Grant this; and it is perhaps the less of the two evils that we throw a horse down where we like, selecting a soft piece of turf, than that we get dashed to pieces by coming in collision with a carriage or cart, a lamp-post, or railing, or slip up on stone pavement, etc. But in answer to this objection we can say that, on an average, once a week the horse we before mentioned *tried* to run away with us, but we invariably stopped him by this plan, and never, during three years, did we ever throw him down. Two other horses that we rode also on one or two occasions tried to run away, and were instantly stopped by this method; thus we have practical proof of its efficacy, against the theoretical objection urged against it.

To a bad or timid rider, or even to one not capable of dealing with it, a runaway horse is a dangerous possession; unless, therefore, a rider is well skilled, well nerved, and strong-armed, our advice is, never mount a known runaway horse.

As, however, every horse may, some time or other, try to run away, the preceding advice should not be neglected, as it may save a fall, a broken arm, leg, or neck.

SHYING.—Shying is a very common practice of horses, particularly of young horses. It may arise from defective sight, or from mere frolic. To a good rider it is of no consequence, but to a bad horseman a fall may result. After a brief acquaintance with an animal, we can tolerably well tell at what objects he usually shies. To overcome this practice we should never be off our guard, but should ever keep a watch on our horse's ears. When we notice that he suddenly raises his ears, and looks attentively at any object, it is probable that he may shy. To avoid such a result, we should endeavor to distract the animal's attention by patting his neck and speaking to him, a slight movement of the reins to arouse him, or by letting the whip rest on his neck, his attention may be withdrawn from the object that alarms him. A brutal and ignorant horseman usually commences thrashing his horse when it shies, and thus only adds to its fear, and causes it to repeat its vice with double effect.

An old horseman used to say that a horse never could surprise him, because its ears always told him what it was thinking of doing. There is much truth in this remark, as every one accustomed to horses must know, and those unaccustomed to them may learn.

REARING.—Rearing is one of the most

dangerous and incurable of vices; it may, however, arise from a harsh use of the curb; but a rearing horse may at any time cause his rider's death by falling back on him. When a horse rears we should sit quietly on him, and well forward. A rider without a firm seat may lean back, holding on to the reins, and will thus pull the horse over on him. A sharp pair of spurs may be used with advantage on a rearing horse, but the reins must be very delicately handled—the cause of rearing being in many cases due to that abominable habit of bad riders of continually jerking their horse's mouth, for no other reason, apparently, than that they *are* themselves bad riders.

Buck-jumping.—Bucking is an endeavor to unseat a rider, and consists in a series



Rearing

of bucks in the air, or a sort of rocking motion produced by a succession of jumps. The horse tries to get its head down between its legs, arches its back, and springs several times from the ground. There is no other means left than to sit the horse through its performance, which generally takes place when first mounted, after which it not unusually will travel quietly all day.

Refusing to Move.—This is not a very common vice, except with a horse which has been cruelly ill-used. We once found a horse belonging to a friend which possessed this vice, and we cured it by getting two leather straps, like handcuffs; by these we fastened the horse's forelegs together so that it could not move, and then sat patiently on its back. In about ten minutes the animal got tired of standing still; but we determined on giving it a lesson, so we kept it hobbled for fully an hour, after which it at once moved on. On every occasion afterward, either the exhibition of these handcuffs or the attempt to put them on, at once was received as a hint, and the horse was ready to start off.

Kicking.—A kicking horse is always dangerous; when, however, we are on his back, it is well to remember that he can not kick with both hind legs while his head is held up. We should, however, be very careful how we allow any one to approach him; also when in the stable great caution is requisite. The same remarks apply to a biting horse; it is better at once to get rid of such a brute, for we are never safe from his vicious habit.

Stumbling.—Stumbling may arise from careless riding or from the imperfect form of a horse. An animal which in its walk or trot does not raise its feet much will usually be a stumbler; and if its fore feet, when they come to the ground, are not placed in advance of the shoulder, the horse is likely to be a dangerous stumbler.

Those who wish to become adepts in regard to horses should, when the opportunity offers, study the form and action of a well-known good horse; the shape of his shoulders, set on of the head, and, in fact, every peculiarity should be noticed.

There is no indicator equal to the eyes and the ears for telling the character of a horse; the eye of a vicious horse never will look good-tempered, nor can he conceal its vicious look. The ears of a playful horse may, to the inexperienced, seem to indicate vice; for a horse that is playful, well bred, and fond of its master or groom, will often put back its ears and bite at its manger when its master approaches it; but this is not vice, and should not be misunderstood for such. Experience in this respect is needed to prevent mistakes.

The bits in most general use are the *Plain Snaffle*, the *Curb*, the *Pelham*, and the *Hanoverian*.

The snaffle is used for horses with good mouths, and may, in the hands of a skilful rider, be used even for hard-mouthed, pulling animals.

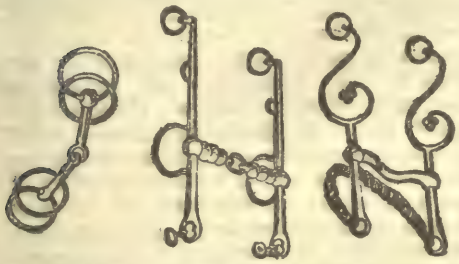
The curb is often used with the snaffle. It is more powerful, and will pull up most horses; it also makes a horse carry his head well, and is a favorite bit with military riders.

The Pelham bit is very powerful, and is that which we recommend for a runaway

horse. It can be used either as a snaffle or curb, and is a very serviceable bit.

The Hanoverian bit is more powerful even than the Pelham, but can not be used as freely or like a snaffle. It is very similar to the curb, the mouthpiece being bigger.

When a rider has become sufficiently skilled to sit a horse well during its trot and canter, it is not improbable that he will wish to try a leap with it, or he may



Varieties of Bits: *a*, the Snaffle; *b*, the Pelham; *c*, the Hanoverian

be desirous of hunting. Should this be the case, the first precaution is to find whether your horse *can* leap.

It is not to be expected that a horse is to know how to do anything which he has not been taught any more than that a man should. Some horses may have reached the age of four or five years, and have never taken a leap; they don't know how to do it, and should be taught. If we ride a strange horse at a stile or stout fence, we may very probably find that the animal has been called upon to perform a feat as difficult to him as for a boy to leap with a pole, when he has never before attempted to do so.

Remarking upon the number of accidents that annually occur in consequence of foolhardy conduct with firearms, when some boy points a gun at his friend, and says, "I'll shoot you!" and straightway does so, while the boy shrieks, "Oh dear! I didn't know it was loaded!" a veteran sportsman once recommended us "*always to treat a gun as if it were loaded and on full cock*, then we shall never have an accident"; so we would recommend a young horseman always to treat a horse as though he were likely to run away, likely to shy, and were unable to leap a stile safely, until we *have personally proved the contrary*. We can easily test our horse's leaping power by trying him at small safe fences; but we must bear in mind that many good horses will often refuse a leap at which they are not ridden in a determined manner. A horse is very quick at finding out whether his rider really means to ride at a leap or is "just a little nervous" about it; and as few animals care to exert themselves unnecessarily, the horse is not likely to take a leap unless he believes his rider means it.

Many horses which have been badly ridden, or bullied by bad riders, have bad tempers, which show themselves by refusing leaps, or refusing other things. A good rider, or even an observant person, will soon discover what irritates his horse, and will avoid any acts which produce this effect.

Horses that are usually ridden vary in age from about four years to seven or eight. Whenever your horse commits any fault, bear in mind that he is not so old as you are, and, in fact, is a mere child in years; treat him accordingly, try to assist his weaker mental powers by your skill, and you will always find him a good and faithful servant; bully and ill treat him, and he is partially your enemy. When once, by ill treatment, you have produced any particular vice in a horse, it is almost impossible to eradicate it.

The age of a horse may be known by



Leaping

his teeth, and the following will aid the tyro in learning how to discover a horse's age.

When a colt is two years old, its teeth are called "milch teeth," the centre of which is whitish.

At three years old the two centre milch teeth are displaced by two which are called "permanent teeth," and are distinguished by being broader, larger, and in the centre upper surface having dark cavities.

When a horse is four years old there will be four instead of two permanent teeth in the lower jaw, and between four and five years old the tusks begin to appear in males. Up to four years old a male is called "a colt," after this age "a horse."

At five years of age the horse's permanent teeth are complete, and the age after this is known by the wearing down of the cavities of the permanent teeth.

At six years old the dark oval mark on the centre teeth is worn down, while the cavities in the other teeth are more filled up. The tusks of the horse are longer than when five years old, but are still sharp and not much worn.

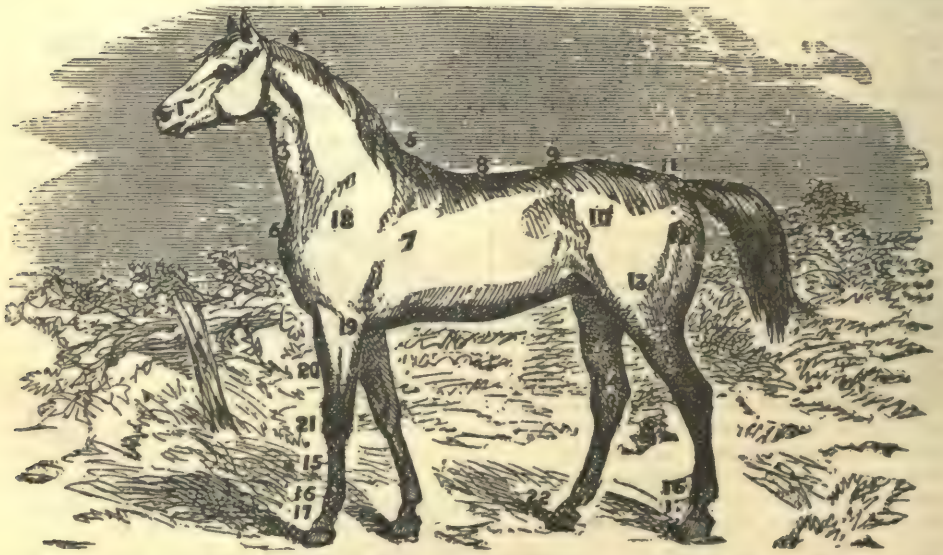
At seven years old the cavities of the second pair of nippers are filled up; the tusks are blunted by wear, and are longer than formerly.

At eight years the horse is sometimes said "not to have a good tooth in its head," that is, the corner nippers are filled up, and the age teeth are nearly all alike, the tusks exhibit greater signs of wear and tear, and are very blunt.

CONCLUDING REMARKS

Be kind and conciliatory to the noble beast that bears you, and never show the spirit of the coward by acting cruelly, or with unnecessary severity, toward a creature so docile, so intelligent, and so useful as the horse. Let the young horseman remember that this creature is endowed not only with strength for our service, and beauty for our admiration, but with nerves sensitive to pain, and a nature keenly alive to ill-usage. To a kind master, a good-tempered horse will by many signs show his attachment, which will increase as he becomes better acquainted with him.

In riding continually in the field, as in cavalry work, exploration, or cowboy's work, the horse is sure to be worn out unless a very simple precaution is observed. The curry-comb will accomplish as much, or more than, an abundance of good feed. In the United States Army regulations, cavalry and artillery horses are required to be curried for three-quarters of an hour in the morning, and for the same length of time before dark. This represents no more than the amount of currying requisite to keep a hard-worked horse in condition. In the field some cavalry leaders are apt to neglect currying to some extent, but military history shows that cavalry commanders who insist upon proper currying of the horses are able to march their commands much greater distances. The value of the curry-comb can not be overstated.



1. Muzzle and parts about the muzzle; 2. Gullet; 3. Windpipe; 4. Crest; 5. Withers; 6. Chest; 7. Girth; 8. Back; 9. Loins; 10. Ilium or Hip; 11. Croup; 12. Haunch or Quarters; 13. Thigh; 14. Hock; 15. Shank or Cannon; 16. Fetlock; 17. Pastern; 18. Shoulder-bone or Scapula; 19. Elbow; 20. Fore-arm; 21. Knee; 22. Coronet

SWIMMING

SWIMMING is the art of keeping the body afloat and propelling it by means of the feet and hands. The swimming of man is artificial, but as the specific gravity of the human body is very little greater than that of water, it can be floated with very little difficulty.

Every boy should be taught to swim, and if he reads the following pages and abides by the instructions, he can easily teach himself.

The first care of the intending swimmer is, of course, to find a proper piece of water in which to learn his first lessons. The very best water that can be found is that of the sea, on account of its saltness and bitterness, whereby two great advantages are obtained.

The first advantage is, that, on account of the salt and other substances which are dissolved in it, the sea-water is so much heavier than fresh that it gives more support to the body, and enables the beginner to float much sooner than he can expect to do in fresh water.

The other advantage is, that the taste of the sea-water is so nauseous that the learner takes very good care to keep his lips tightly shut, and so does not commit the common error of opening the mouth, which is fatal to all swimming, and is sure to dishearten a beginner by letting water get down his throat and half choke him.

CONDITIONS AND METHODS OF SWIMMING

AS TO PLACE, there is nothing better than a sloping sandy shore, where the tide is not very strong. In some places the tide runs with such a force that if the beginner is taken off his legs he will be carried away, or, at least, he will have great difficulty in regaining his feet.

Take a special care of the holes, for there is nothing so treacherous. A hole of some six or seven inches in depth and a yard in diameter looks so insignificant when the water is out that few persons would take any notice of it; but, when a novice is in the water, these few inches may just make the difference between safety and death.

On sandy shores the most fertile source of holes is to be found in large stones, which sink rather deeply into the sand. Around these the water courses as the tides ebb and flow, thus cutting a channel. Even when the stone is removed, the hole will remain unfilled through several tides.

The next best place for learning to swim is a river with a fine sandy bed, clear water, and no weeds.

When such a spot has been found, the next care is to examine the bed of the river and to remove very carefully everything that might hurt the feet. If bushes should grow on the banks, look out carefully for broken scraps of boughs, which

fall into the stream, become saturated with water, sink to the bottom, and become fixed with one of the points upward.

If human habitations should be near, beware of broken glass and crockery; fragments of which are generally flung into the river, and will inflict most dangerous wounds if trodden on. If the bed of the stream should be in the least muddy, look out for shells, which lie imbedded nearly to their sharp edges, that project upward and cut the feet almost as badly as broken glass.

Failing sea and river, a pond or canal is the only resource, and furnishes the very worst kind of water. The bed of most ponds is studded with all kinds of cutting and piercing objects, which are thrown in by careless boys, and remain where they fall. Then, the bottom is almost invariably muddy, and the water is seldom clean. Still, bad as is a pond, it is better than nothing, and the intending swimmer may console himself with the reflection that he is doing his duty, and with the prospect of swimming in the sea some time or other.

CONFIDENCE

As the very essence of swimming lies in confidence, it is always better for the learner to feel secure that he can leave the water whenever he likes. Therefore, let him take a light rope of tolerable length, tie one end to some firm object on the bank, and let the rest of the rope lie in the water. "Manila" is the best kind of rope for this purpose, because it is so light that it floats on the surface instead of sinking, as is the case with an ordinary hempen rope.

If there is only sand on the shore, the rope can be moored quite firmly by tying it to the middle of a stout stick, burying the stick a foot or so in the sand, and filling up the trench. You may pull till you break the rope, but you will never pull the stick out of its place. If you are *very* nervous, tie two sticks in the shape of a cross and bury them in like manner.

The rope need not be a large one, as it will not have to sustain the whole weight of your body, and it will be found that a cord as thick as an ordinary washing-line will answer every purpose.

On the side of a stream or pond, tie the rope to a tree, or hammer a stake in the ground. A stick eighteen inches in length and as thick as an ordinary broomstick is quite large enough. Hammer it rather more than two-thirds into the ground, and let it lean boldly away from the water's edge. The best way of fixing the rope to it is by the "clove hitch."

Now, having your rope in your hand, go quietly into the water *backward*, keeping your face toward the bank. As soon as you are fairly in the water, duck completely beneath the surface. Be sure that you really do go fairly under water, for there is nothing more deceptive than the feel of the water to a novice. He dips his head, as he fancies, at least a foot beneath the surface; he feels the water in his nose, he hears it in his ears, and thinks he is almost at the bottom, when, in reality the back of his head is quite dry.

The best way of "ducking" easily is to put the left hand on the back of the head,



Diving

hold to the rope with the right hand, and then duck until the left hand is well under water.

The learner should next accustom himself to the new element by moving about as much as possible, walking as far as the rope will allow him, and jumping up and down so as to learn by experience the buoyancy of the water.

Perhaps the first day may be occupied by this preliminary process, and on the second visit the real business may begin.

In swimming, as in most other pursuits, a good beginning is invaluable.

Let the learner bestow a little care on the preliminaries, and he will have no bad habits to unteach himself afterward. It is quite as easy to learn a good style at first as a bad style, although the novice may just at the beginning fancy that he could do better by following his own devices.

The first great object is to feel a perfect

confidence in the sustaining power of the water, and, according to our ideas, the best method of doing so is by learning to float on the back.

FLOATING ON THE BACK

Take care that the cord is within easy reach, so that it may be grasped in a moment, should the novice become nervous, as he is rather apt to do just at first. Take it in both hands, and lay yourself very gently in the water, arching the spine backward as much as possible, and keeping the legs and knees perfectly straight and stiff.

Now press the head as far back as possibly can be done, and try to force the back of the head between the shoulder-blades. You can practice this attitude at home, by lying on two chairs and seeing whether your attitude corresponds with that which is given in the illustration.

When you have thus lain in the water you will find that you are almost entirely upheld by its sustaining power, and that



Floating on the Back

only a very little weight is sustained by the rope. On reflection you will also discern that the only weight which pulls on the rope is that of your hands and arms, which are out of water, and which, therefore, act as dead weight.

Indeed you might just as well lay several iron weights of a pound each upon your body, for the hands and arms are much heavier than we generally fancy. Just break an arm or a leg, and you will find out what heavy articles they are.

Now let your arms sink gradually into the water, and you will see that exactly in proportion as they sink, so much weight is taken off the rope; and if you have only courage to put them entirely under water, and to loose the rope, your body will be supported by the water alone.

SWIMMING ON THE BACK

There are many modes of swimming on the back, head first; some in which the hands are the moving power, others in which the force is derived from the legs, and some in which the legs and arms are both exerted.

To practice one of these methods—viz., that commonly called floating—you should throw your head gently back, as before, bringing your feet to the surface; let your arms lie in the water close to your sides, using the hands in the same manner as when sculling, with a swift pushing motion of the palms toward the feet, returning edgewise, thumbs first, by bending the arms; and pushing again toward the feet by straightening the arms close to the sides. This produces a very rapid progress through the water and may be continued for some time.

Another method is as follows: Throw yourself round on your back without stopping (which may be done with a swing of the body, while swimming in the first described method), and you will retain part of the impetus already acquired. Then throw both hands out of the water, as far as you can reach, in the direction you wish to proceed, entering again edgewise beyond your head, and describe a segment of a circle in the water, having the shoulders for a centre. The hands on appearing again on the surface below the hips should pass immediately through the air for another stroke. This mode is very serviceable when taken with cramp or symptoms of cramp, as it removes the stress entirely off the muscles of the leg. It may be gracefully varied by using the right and left hands alternately.

For the practice of a third method the hands and arms are to be used as in the last, but the progress should be aided by the lower limbs striking out with vigor, after having been drawn up to the body by the stroke made with the arms. The kick should be made as the hands pass through the air. This is a very quick manner of swimming, and is most commonly resorted to for relief when swimming in a match.

For another method, lie on your back with your arms folded, or with your hands passed over your shoulders beneath your neck, or floating quietly by your side, drawing up your legs toward the chest as high as possible and then striking them backward with vigor, which will cause you to make considerable progress through the water without using the arms at all. When you draw up your feet the movement is against the surface, where there is little resistance, but, when you strike them out, the force is applied in a downward direc-

tion where the resistance is greatest. The foregoing method is useful when your arms are tired, or you have something to carry or tow after you, the hands being perfectly free.

Steering the course is easily managed by means of the legs. If the left leg is allowed to remain still, and the right leg is used, the body is driven to the left, and *vice versâ* when the left leg is used and the right kept quiet. The young swimmer must remember that when he brings his legs together they must be kept quite straight and the knees stiff. The toes should also be pointed, so as to offer no resistance to the water.

Swimming on the back is a most useful branch of the art, as it requires comparatively little exertion and serves to rest the arms when they are tired with the ordinary mode of swimming. All swimmers who have to traverse a considerable distance always turn occasionally on the back. They even in this position allow the arms to lie by the sides until they are completely rested, while at the same time the body is gently sent through the water by the legs.

Let swimming on the back be perfectly learned, and practiced continually, so that the young swimmer may always feel secure of himself when he is in that position.

The feet should be kept about twelve or fourteen inches below the surface of the water, as, if they are kept too high, the stroke is apt to drive the upper part of the head and eyes under the water.

It must always be remarked that it is impossible to arch the spine too much, or to press the head too far between the shoulders.

SWIMMING ON THE CHEST

We now come to swimming on the chest, which is the mode adopted by most persons, and which, together with swimming on the back, will enable the learner to perform almost any aquatic feat.

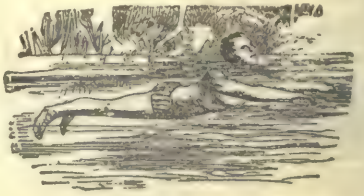
In order to begin with confidence, walk into the water until it is almost as high as the chest, and then turn toward the land, so that every movement may carry you from the deeper to the shallower water. Next place your hands in front of the chest, the fingers stiff and pressed together, and the thumb held tightly against the forefinger. Do not press the palms together, as too many books enjoin, but hold the hands with the thumbs together, the palms downward and the backs upward.

Now lean gently forward in the water, pushing your hands out before you until the arms are quite straight, and just before your feet leave the bottom give a little push forward. You will now propel yourself a foot or two toward the land. Try how long you can float, and then gently drop the feet to the bottom. Be careful to keep the head well back and the spine arched.

Repeat this seven or eight times, until you have gained confidence that the water will support you for a few seconds. The accompanying illustration shows the proper attitude.

Now go back to the spot whence you started, and try to make a stroke. Lay yourself on the water as before, but when the feet leave the bottom draw them up close to the body, and then kick them out quickly. When they have reached their full extent, press them together firmly, keeping them quite straight and the toes pointed.

This movement will drive you onward for a short distance, and when you feel



Swimming on the Chest

that you are likely to sink, drop the feet as before. Start again and make another stroke, and so on until the water is too shallow.

At first you will hardly gain more than an inch or two at each stroke; but after a little practice you will gain more and more until you can advance three or four feet without putting the legs to the ground. It is a good plan to start always from the same spot, and to try in how few strokes you can reach the land. There is a great interest in having some definite object in view, and one gets quite excited in trying to reduce the number of strokes.

The next point is the movement of the arms.

In reality the arms are more valuable in swimming than the legs, and for this simple reason: any one who has the use of his limbs at all is obliged to use his legs daily, and that to a considerable extent. However sedentary he may be, he must walk up and down stairs twice at least in the day. He must walk from one room to another.

He must get into and out of his carriage, and walk a few paces to his office. And in all these little walks his legs have to carry the weight of his body, which, to set it at the least figure, weighs from seventy to ninety pounds.

THE SIDE-STROKE

There is no stroke that enables the swimmer to last so long as this does, and for this reason: instead of employing both arms and legs simultaneously in the same manner, the side-stroke employs them simultaneously, but in different manners; so that when the swimmer is tired of exercising one side he can just turn over and proceed with the other, the change of action resting the limbs almost as much as actual repose would do.

The side-stroke is thus managed: the swimmer lies on his right side, stretching his right arm out as far as he can reach, keeping the fingers of the right hand quite straight and the hand itself held edgewise, so as to cut the water like a shark's fin. The left hand is placed across the chest, with the back against the right breast, and the swimmer is then ready to begin.

He commences by making the usual stroke with his legs, and the right leg, being undermost, doing the greater share of the work. Before the impetus gained by the stroke is quite expended, the right arm is brought round with a broad sweep, until the palm of the hand almost touches the right thigh. At the same moment, the left hand makes a similar sweep, but is carried backward as far as it can go.

The reader will see that the hands act directly upon the water like the blades of



The Side-Stroke

a pair of oars, and do not waste any of their power by oblique action.

In ordinary swimming we seldom use the left arm, but allow it to hang quietly in the water, so that it may be perfectly ready for work when wanted. Then, after some little time we turn round, swim on the other side and give the left arm its fair share of labor.

OUTDOOR GAMES

IN a certain sense it is true that each nation—largely, also, each period of time—has its own outdoor game. For very many years cricket and football have been popular in England, whence they were imported to America; golf came to us from Scotland; croquet, probably, from France; tennis, in some form, has been played in England for several centuries. Baseball has been well called the "national game" of the United States, and is seldom played in other countries.

As for polo, it was originated in the Far East—in India or Persia—perhaps before the Christian Era, and was frequently mentioned by the native poets and historians of the eighth and ninth centuries A.D., who relate many remarkable anecdotes of the royal and noble players of the period. The Persian and Hindu name was *chaugan;* the Japanese name, *dakin,* meaning "strike-ball"; the present name, *polo,* derives from the Thibetan word, *pulu,* meaning a "ball of willow wood." The game mentioned as "tennis" in the "Arabian Nights" is very probably polo.

According to the claims of some writers, polo was played in England several centuries ago, under the name "pala maglia," which is used by several writers and travellers of the period. The name Pall Mall, so familiar to Londoners, is said to be derived from this game, which was formerly played at the place so designated. A somewhat similar game, called "knappen," was played in Wales during the reign of Queen Elizabeth, but long since fell into disuse. As at present played in England and America, polo is a comparatively recent importation, having been introduced by some officers of the 10th Hussars at Aldershot, England, in 1869. It immediately gained great popularity among the English cavalry regiments; the first notable match between contending teams having been played on Hounslow Heath, in June, 1870, between the 1st Life Guards, on the one side, and the officers from the 9th Lancers and 10th Hussars on the other. Since that time the popularity of the game has constantly increased, and it is now a favorite diversion on both sides of the Atlantic.

The most popular outdoor games at the present time in America are golf, tennis, and baseball, the two former having, in large measure, supplanted croquet. The value of an outdoor game as a means of exercise can not be overrated. Even such mild exercise as is found in golf and croquet is most beneficial to persons of sedentary habits.

RULES FOR THE GAME OF POLO

AMONG the indispensable requirements for a good game of polo, we may mention: (1) Players who are expert horsemen; (2) thoroughly trained ponies, capable of good speed and perfectly under the control of their riders; (3) thorough knowledge of the game, including the location of goals, the duties of the several members of the team, and thorough acquaintance with the playing qualities of each; (4) expertness begotten of constant practice in hitting the ball, both back and front, on either side.

Regarding the mounts suitable for this game, it may be said that ponies—which term indicates small breeds of horse, somewhat like the American "mustang"—have been found more suitable than horses of ordinary size; not only from the fact that they are light, strong, and swift, in proportion to their size, but also involve a much shorter reach to the ground, a most important consideration in making near-side strokes.

RULES FOR PRACTICE.—In practicing for the game two things are necessary—always assuming, of course, that the would-be player is an accomplished horseman. These are: (1) to practice the four fundamental strokes—the straight-forward back and front, and the near-side back and front—and (2) to train the pony to respond readily to the slightest movement, and eventually to understand the game so far as to follow the ball. In training the pony, one must practice with a companion, preferably one of his own team, the process of training and the things to be taught depending on the position of his rider in the team. In learning the strokes, however, the would-be polo player faces a much more difficult proposition. In the first place, he must learn how to hit the ball, both when lying on the ground and when bowled to him by a companion. This is by no manner of means easy, and, at best, requires considerable careful practice. In the second place, the player must learn to hit the ball without also hitting his horse's legs. If he is not thoroughly beyond this form of bungling, he will frequently run the risk of injuring his mount and spoiling his own pleasure. The early stages of practice, therefore, had best be taken on a wooden horse—somewhat the same kind of apparatus as is used in gymnasiums—if also of the same height as your polo pony, which is generally about 14 hands. When the novice has advanced sufficiently to avoid hitting the legs of the wooden horse. when aiming at balls bowled to the one side or the other by his companion, he may try his hand on the live mount. One advantage of using the pony in practice, after one has acquired a moderate facility at striking, is that he may regulate his distance sufficiently to allow him to take a stroke with his full arm; thus gaining the advantage of superior force, while avoiding any movements liable to injure his mount or break his stick.

ESSENTIALS OF THE GAME.—The game of polo is played on an especially arranged field or ground, measuring, according to standard requirements, at least 750 feet in length and 500 feet in width. At either end of this ground is a goal; each team having its own designated at the beginning of the game. The object of the game, as in football, is to make a goal or to send the ball between the posts; each team endeavoring to carry the ball toward the opposite end of the field, and bending every effort to accomplish this result. In this work, each man on the team has his own particular part, which he must thoroughly understand and carefully follow out. The game is not an indiscriminate hitting at the ball, at any and every time it comes within reach, nor is it always permissible for one player to make the movements perfectly proper for another.

As has been well remarked, "polo is essentially a game of combinations." Thus, the four players on a side combine into two pairs; Nos. 1 and 2 playing together, and Nos. 3 and 4 forming another combination. Each player, and each pair, has particular duties assigned, and is required to devote his attention to performing them. Whenever it is possible, the two players of each pair should practice together daily, in order that each may become thoroughly acquainted with the play of the other. Therefore, as we shall understand presently, the assignment of ponies usually recommended is, as follows: the most reliable to Nos. 3 and 4; the most manageable to No. 3; the fastest to Nos. 1 and 2. In the terminology of the game, Nos. 1 and 2 are called "forwards" and No. 4 the "back."

Beginning the Game.—In beginning the game the two teams, of four players each, place themselves in any one of the several recognized arrangements—as chosen by their respective captains—on either side of a line drawn through the centre of the field from side to side. The ball is then thrown down by the umpire, and the play begins by the proper player on either side hitting the ball, in the attempt to drive it toward the goal, and is continued by the

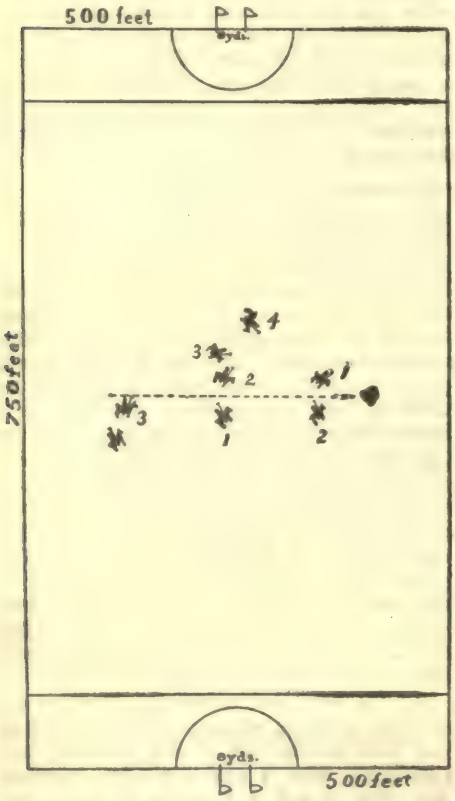


Diagram of a Polo field, showing opposing teams (each member designated by his proper number) arranged in two common orders on either side of the median line. The umpire, standing at +, throws in the ball along the line drawn between the two teams

other players, who either assist him in this effort or use recognized tactics to prevent the other side from interfering, or from gaining the advantage. One of the most notable methods of accomplishing these ends is what is known as riding-off or riding-out, which may be defined as the act of riding up to a player of the opposing team, so as to interpose one's own pony between him and the ball, in order to prevent him from taking possession of it, or from interfering with a player of one's own team who is in position to strike it. If, however, the player on the opposite side is already "in possession" of the ball—which is to say, has struck it and is following up his advantage—he may not be ridden off. In riding off, the two ponies run abreast, or side by side, and any fair and gentlemanly force is permissible, either to change your opponent's course, or to prevent him from changing yours. No other jostling or pushing is allowed, however, except by the use of the arm from the shoulder to the elbow, held close against the body.

The Players and their Duties.—The object of arranging the teams on either side of the line through which the ball is thrown by the umpire, as already described, is to enable the proper performance of duties by the several players. Briefly explained, the duties of the several players may be summed up as follows from back to forward:

No. 4.—It is the duty of No. 4 to prevent the ball from passing him, and to strike it back to his own No. 3. The duty of No. 3 is to pass the ball to his No. 2, and, also, to support No. 4 by preventing players on the opposite team from interfering with the performance of his duties. The duties of No. 2 include striking the ball toward the opposite goal posts and following it up until, if possible, he makes a goal. The duties of No. 1 are largely included in preventing No. 4 of the opposing team from hitting the ball to his own forward. The duties of the several players are, in general, fixed and determined as here specified, although Nos. 1 and 3 may, on occasion, perform the duties of No. 2, in hitting the ball forward to a goal—No. 2 being, meantime, occupied in riding off the opposing Nos. 3 or 4, as will be presently explained, or else being so strongly harassed, as to be unable to discharge his proper functions.

Provided all the players on a given team are equally expert in their own parts, No. 4 is nearly the most important member. His duties always place him, as his name indicates, as the rear of his team, so that he may meet the ball sent toward his goal by the opposing team, and pass it forward to his own Nos. 3 and 2. He may assist them, in attack, to make a goal by doing his part in keeping his ball forward. It seldom happens that he is called upon to go into the game, carrying the

ball forward to the goal, unless his own forwards are far weaker players than himself. His best service is to constantly maintain his proper position at the rear. One especially essential thing is that he should ride a fast pony and be always alert himself; keeping his eye constantly upon the ball. As a rule, he should hit a back-hand stroke; since he can thus give the ball far better force and speed than by meeting it with front stroke, and is also in position to pursue and overtake it. Quickness of movement and force in hitting are his most essential qualities.

No. 3.—The duties of No. 3 render him scarcely second in importance, since he must both assist his own No. 4 in passing the ball forward, and also protect him, in the event of attack from one of the opposite team. Under ordinary circumstances, his best service may be rendered at the rear, where he may perform the duties of No. 4, when occasion demands, and also meet and stop the ball. He should be a strong hitter, fully practiced in striking the ball from either front or rear. In stopping the ball it is generally found best to meet it back-handed, and, then turning, to send it forward with a front stroke. The duties of No. 3 vary slightly, according as his team is in attack or defence. In the former case, he must not only pass the ball forward, but also be ready to back up his own No. 2, by "riding the chord of an arc," when possible, and reaching the moving ball before any of the opposing team. In defence, he must not only stop and meet the ball and send it forward to his own No. 2, but must often ride-off the No. 2 of the opposing team, thus preventing his own No. 4 from being harassed by two opponents at once. Since his duties lead him to assist both No. 2 and No. 4, he should always be the man of soundest judgment on the team, and ride the most manageable pony.

No. 2.—In a well-trained team, playing a game in strict accord with the rules, No. 2 is virtually the real playing member; since it is upon him devolves the duty of sending the ball through the opposite goal posts. For the performance of this duty he should be thoroughly expert at hitting the ball on a run, and should be mounted on a pony that is so thoroughly well trained to the game, as not to "pull" or race away too fast to permit an effective stroke. This means that, while his pony should be capable of making good speed, he should be so thoroughly under control as not to turn the game into a race. So far as his qualifications are concerned, No. 2 must (1) constantly bear in mind the location of the goal posts of the opposing team; (2) must be able to hit the ball without being obliged to first stop and "steady" on it, thus actually checking its forward travel. Since, in very many cases, No. 2 will be so seriously harassed that he can not make the goal himself, he must be prepared to strike it forward on a run to his own No. 1 or No. 3, who may be riding on a chord of an arc to meet it, thus allowing either of them to perform his duties in sending the ball forward.



Straightforward Front Stroke

Were it not that the duties of No. 2 could, on such occasions, devolve upon No. 1 or No. 3, a large part of very many polo games would be merely the crowding of No. 2. Since, also, No. 2 is frequently liable to be ridden off by the opposing No. 3, his own No. 1 and No. 3 are hardly in position to assist him defensively. He must thus be ready to change places with No. 1 or No. 3 whenever required.

If, in a strongly contested game, the ball is in possession of No. 1 or No. 3, No. 2 will find it the best plan not to attempt to resume it himself, unless sure of his ability to make a goal. In such an emer-

gency, he may be required to ride-off the opposing No. 3 or No. 4. In fact, in defence, No. 2, always in front of his own team, should avail himself of the opportunity to assist his own man by riding-off the opposing No. 3 should such a movement be necessary.

In general, the proper strokes for No. 2 should be straight forward, and not on the near side. He may, however, on occasion, hit out from behind to meet a ball; thus sending it forward to his own Nos. 1 and 3. For the purpose of making a straight goal, No. 2 should constantly bear in mind that the ball must be kept moving on a



Straightforward Back Stroke

line, as near by as possible, through the centre of the field. To this end he should not only aim to drive it forward, in attack, but also to drive it to the centre line, whenever the opposing team has succeeded in driving it to the one side or the other. If, however, he has succeeded in driving it forward, near to the goal posts, but somewhat to one side, he should not attempt to cut through the post sidewise, but should strike the ball back-hand to his own No. 3, whose position is in front of the goal, ready to follow up the advantage.

No. 1.—The duties of the man playing No. 1 on the team are principally those of a general guard: (1) in stopping the ball sent toward his own goal by the opposite team, or (2) by preventing the opposite No. 4 from performing his proper duties. In order to be thoroughly proficient in performing his part on the team, No. 1 must have (1) a thorough knowledge of the play of his own No. 2, with whom it is desirable that he should practice, as often and as regularly as possible, and (2) he should be mounted on the best-trained pony in the team. His pony should be trained to obey the rein absolutely; to be able to start and stop suddenly, and be easily guided in riding-off the opposing No. 4, whenever necessary.

In interfering with the No. 4 of the opposing team, No. 1 will frequently find it impossible to ride him off. If, for example, these two opposing players are racing for the ball—the opposing No. 4 with a view to protecting his own goal, and our own No. 1 with a view to preventing it from being stopped—No. 1, if sufficiently near to No. 4, may prevent him from stopping it by reaching forward and "crooking his stick." In the act of crooking an adversary's stick, the standard rule must be rigorously observed; that No. 1 must be on the same side of No. 4's pony as is the ball, or in a straight line behind him; so that his stick shall pass neither under nor over his adversary's pony.

In addition to harassing the play of No. 4 of the opposing team, No. 1 should constantly watch the opposing No. 3, in order to prevent him from hitting the ball. Thus, if the opposing No. 4 has met and struck back the ball, our No. 1 may ride to the rear, in order to prevent the opposing No. 3 from striking it; striving, if possible, to come between that No. 3 and the ball.

In the event that the No. 4 of the opposing team should miss stopping the ball, or should hang back, it is the duty of No. 1 to hit past him for a goal, leaving his own No. 2 to ride off the opposing No. 4 if possible. In fact, No. 1 has many chances of making a goal.

The American Regulations.—While the game of polo, like football, cricket, and several other athletic sports, is played under slightly different rules in England, America, and the East, it is not necessary in the present treatise to pass very far beyond the rules observed under the American regulations. According to these rules, the American play is somewhat simpler and has fewer regulations than those observed

in other countries. However, in order to play a perfectly correct game it is necessary to observe but three things: (1) that the real object of the game is to land the ball beyond and between the goal posts; (2) that each player should thoroughly understand his own duties and limitations, also the duties and limitations of the other players on all occasions; that each player should be thoroughly trained and practiced in performing his own duties, and should be mounted on a pony chosen with regard to qualities best suited to the part. In these respects the game of polo is played, with reference not only to particular combinations of players, but also with reference to the special aptitude of each.



Nearside Front Stroke

Furthermore, the pony to be mounted by each player must be carefully selected and trained to perform the particular part to which he is assigned, just as the hounds in a pack naturally assume the places and functions, in a hunt, for which innate qualities best adapt them.

(1.) The grounds to be about 750 feet long by 500 feet wide, with a ten-inch guard from end to end on the side only.

(2.) The height of the ponies must not exceed 14 hands and 1 inch.

(3.) The balls to be of bass wood, with no other covering than paint, 3 1-8 inches in diameter, and not to exceed 5 ounces in weight. Mallets to be such as are approved by the committee.

(4.) The goal posts to be 24 feet apart, and light enough to break if collided with.

(5.) Match games between pairs shall be two periods of fifteen minutes each, actual play. Time between goals and delays not counted; two minutes after a goal has been made and five minutes between periods for rest, unless otherwise specified.

(6.) Match games between teams of three shall be four periods of fifteen minutes each, actual play. Time between goals and delays not counted; two minutes after a goal has been made and five minutes between periods for rest, unless otherwise specified.

(7.) Match games between teams of four shall be three periods of twenty minutes each, actual play. Time between goals and delays not counted; two minutes after a goal has been made and ten minutes between the periods for rest, unless otherwise specified.

(8.) Each team to choose an umpire, and, if necessary, the two umpires to appoint a referee, whose decision shall be final.

(9.) Each team should have a substitute in readiness to play when a match is on.

(10.) There shall be a captain for each team, who shall have the direction of positions and plays of his men. The home captain shall provide two acceptable goal judges, whose decision shall be final in regard to goals made at the end at which he may be placed.

. . . . . .

(12.) Only players, umpires, and referee allowed upon the grounds during the progress of the game.

(13.) The game to begin when the ball is thrown between the contestants, who shall be in line facing each other in the middle of the field, unless it is agreed between the captains to charge. The charge to be from a line 30 feet in front of the goal-posts. When the signal to charge has been given, the first and second players must keep to the left of the ball until it has been hit.

(14.) It is forbidden to touch an adversary, his pony, or his mallet with the hand or mallet during play, or to strike the ball when dismounted. A player should not put his stick over his adversary's pony either in front or behind. In "riding off" or "hustling," a player shall not push or strike with his arm or elbow.

(15.) When the game is resumed, the ball shall be thrown between the players, who shall be lined up at the point at which the ball is stopped. But if the game is stopped on account of a foul, the ball is to be thrown in at the place at which the foul occurred.

(16.) When the limit of time has expired, the game must continue until the ball goes out of bounds or a goal is made, and such overtime shall not be counted.

(17.) In event of a tie at the end of the last period, the game to be continued until one side is credited with a goal or part of a goal.

(18.) When the ball goes out of bounds at the sides, it must be thrown in from the place at which it went out, by the referee or by an impartial person, between the two sides, which shall be drawn up in line facing each other. When the ball goes out ends, the side defending that goal is entitled to a knock-out from the point at which it crossed the line. When the player having the knock-out causes unnecessary delay, the referee may throw a ball on the field and call play. No opponent shall come within 50 feet of a player having the knock-out until the ball has been hit.

(19.) Whenever a player, either accidentally or intentionally, knocks the ball behind the line at the end at which the goal defended by his side is situated, it shall be deemed a safety knock-out, and shall score one-fourth of one goal against such player's side. When the ball is caromed out or [illegible]ked out by a pony, it shall not score as above.

(20.) The referee shall have power to impose a fine not exceeding forty dollars on any team, or member of a team, that shall fail to appear within a reasonable time of the hour named for the events for which they have been entered, or for any misconduct or violation of the rules during the progress of the games, and shall report the same in writing to the committee for enforcement. And he may exclude from the game any dangerous or vicious pony; and he may start the game, notwithstanding the absence of any players, after the time fixed.

(21.) A player requiring a mallet during the game must ride to the end or side line to procure one; it must not be brought on the field to him.

(22.) The referee may stop the game at any time when the ball is broken, or when it strikes the referee, or his pony, and may substitute another ball by throwing it between the players at a point as near as possible to where it was stopped.

(23.) A ball must go over and clear of the line to be out, and over and clear of the line to count a goal. When a ball is hit above the top of the goal-posts, but in the opinion of the referee through, it shall be considered a goal.

(24.) Foul riding is careless and dangerous horsemanship, and lack of consideration for the safety of others. A player in the possession of the ball has the right of way, and no one shall cross him, unless at such a distance as to avoid all possibility of a collision.

(25.) The referee may suspend a player for the match for a foul, or he may award the opposing side a half-goal.

(26.) When a player is replaced by a substitute, he can not return to the team the same day, except to take the place of a player who is incapacitated. In any change of players after the game has begun, the handicap of the man having the highest number of goals shall be counted.

(27.) Any member of the committee may measure ponies (not his own) and issue certificates, good for the season for ponies under five years of age. Ponies five years old or over, holding such certificates, need not be measured again.

. . . . . .

(34.) No dismounted player shall be allowed in any way to take part in the game while dismounted.

GOLF

GOLF is called the "Game of Kings," for the reason that Scottish sovereigns are believed to have played the game, in one form or another, since Scotia first existed. Unlike most out-of-door sports, it can not be played under cover—though, of course, some of the shots may be practiced in such a place as a riding school. Even here, however, the ideal conditions of this royal game do not exist, for the real golf field is a meadow covered with short grass. This field should be as near the sea as possible, as a sandy soil is much to be preferred. The word "links" is applied to the field merely because in Scotland stretches of meadow and sand close to the sea are so termed in the vernacular.

"Bunkers" are ordinary depressions in such a sandy soil. These "bunkers" are called "hazards," although any obstacle, such as trees, water, roads, high grass, brush, or fences—or, in short, anything that interferes with the effective progress of the ball—is known by that general term.

The course consists of eighteen holes, generally arranged in the form of a circle. On some courses, where the saving of land area is an object, the holes are arranged in circles, one within the other, of nine holes each.

The idea of golf is to put the ball—a small one, gutta-percha—into the holes consecutively, and with the least number of strokes. There are several ways of playing the game. In "singles," two persons play against each other, each having a ball. The number of holes made, and not the number of strokes, decides the victory. In "foursomes," two persons play against two others. Both in "singles" and "foursomes," each side has its own ball. In "foursomes," "hole play" is usual. The game is won in either by the player or the side that wins more holes than the opponent, each hole being won by the player or side that makes it in the least number of strokes.

There is another form of the game, known as "medal play," in which the winner is the one who makes the entire round of the holes in the least number of strokes.

When beginning, the player puts a little pat of sand down on the "teeing ground," and on top of this places the ball. With the appropriate club he drives the sphere as close as he can to the first hole. From whatever point at which the ball lands he must drive it with one of his clubs, it not being permissible to touch the ball with his hands until it has gone into the first hole. This latter feat having been accomplished, he lifts the ball from the hole and tees it again, preparatory for a drive to the second hole, and so on around the course. The distance between holes may be from 100 to 500 yards, to suit the limits of the grounds or the wishes of the players.

A complete outfit of clubs consists of nineteen, though many excellent players do with a less number. The complete list, and their uses, are as follows:

(1) The Driver, or play club, is used to send the ball from the tee, or wherever else it lies, for a long distance.

(2) The Putter is required for short strokes. It has a short shaft, with the head nearly at right angles.

(3) The Cleek is the longest driver of all the clubs, with metal heads.

(4) The Brassie resembles the driver, but has a brass plate and is used for playing "through the green."

(5) The Brassie Niblic has a smaller head than the driver; the face is spooned back and the sole is shod with brass. This club is used with the idea of raising the ball in the air from a depression in the ground.

(6) The Long Spoon has the same kind of head as the brassie, though very much spooned, with a long shaft.

(7) The Mid Spoon, the same as the preceding, but with medium length of shaft.

(8) The Short Spoon, also the same, but with very short shaft.

(9) The Driving Iron, of deeper blade than the cleek, will not drive as far, but will send the ball higher.

(10) The Lofting Iron, very much like the preceding, but will send the ball higher.

(11) The Niblic, for getting the ball out of hazards, very heavy and with a small, rounded head.

(12) The Baffy.

(13) Bulger Driver.

(14) Bulger Brassie.

(15) Putting Cleek.

(16) Driving Cleek.

(17) Mashie.

(18) Gun Metal. Putter.

(19) Medium Iron.

The best length of a single drive is about 175 yards, and one of 200, over average ground, is considered very good. A drive of 280 yards has been recorded in Scotland.

STYLE

This is the first essential for a beginner to cultivate. It is an absolute requirement of good play, and can be acquired only from a player of much experience and skill. Suppose you are ready to tee the ball. To "sole" the ball let the head lie flat on the ground, with the face, or part of the club that is intended to strike the ball, at a perfect right angle to the direction in which you mean to drive. Stand parallel to the line of the ball's flight, with the feet in line with each other. The feet should be a little apart, and about equi-distant from a line drawn between them from the ball. The hands, both grasping the club, should be in front of the body. There are many other rules and theories as to how to stand, and how to swing the club, but most of these can be learned only from practice. Experts state that mastery of the art of swinging Indian clubs gives the beginner a quicker comprehension of the principles of the most correct stroke than weeks of special study.

An "Approach" comprises the strokes that are necessary to drive the ball to the destined hole. It is in this line of work that the skill of the player shows itself to best advantage. When the number of strokes required for holing counts on the score, it is imperative to gain each hole with the least number of separate plays. Unless peculiar conditions prevail, it is better to use one of the long drivers until the player has the ball near enough to the hole for him to call a different club into use.

In making the approach and in selecting the clubs that are required for this purpose one must consider the distance, the necessity for elevating the ball, and the existence or non-existence of what may prove troublesome hazards. The Three-quarter stroke (which is rarely used now on account of the introduction of iron clubs), the Halfshot and Stiff Arm Approach are fine points of play that can be picked up only by long and close study of the work of the best players.

PUTTING

This is the delicate work that must be done when the player has the ball close to the destined hole. It is at this point of the game that the greatest care in the selection of the clubs must be made. After the player has calculated his shot, he must keep his eyes on the ball without glancing at the hole just as he puts. He must be careful not to aim too long, yet must be sure to reach the hole.

After the beginner has mastered the first principles of the "Approach," he should then acquire, by frequent practice, all possible experience and skill in putting.

ETIQUETTE OF THE GAME

On the field there are many rules that the player must observe as faithfully as if they were a part of the law of the state. The first one is that a single

player, who is merely practicing, must withdraw and bide his time whenever players in a regular match desire to use the links.

During the making of any stroke no onlooker, whether player or spectator, should move or speak.

A player who is ready to use a tee must wait until all the players just ahead of him have made their second strokes; and no player has the right to reach the next hole until the players ahead of him have holed and gone sufficiently beyond him.

Players in search of a lost ball, however, must allow players in other games to reach and pass them.

A single, threesome, or foursome has the right, on request, to pass a three-ball match. A match that is playing the entire round can claim the right to pass a match playing less than the entire course.

When a player, by a stroke, displaces a bit of the turf, he, or some one for him, should at once replace it. The same applies to a hole made in a bunker.

While the distances between the holes may vary from 100 to 500 yards, it is not by any means necessary—and is seldom advisable—that the distances between holes be made uniform. It is a general practice to gauge the distances by the difficulties presented in the surfaces traversed.

DEFINITIONS OF GOLF TERMS

ADDRESSING THE BALL.—The player placing himself in position for a stroke.

BAFF.—Striking the ball with the sole of the club-head in order to send the ball into the air.

CADDIE.—The one who carries the player's clubs, and who usually acts as an adviser regarding the best plays to be made.

CUP.—A small hole made by the stroke of an earlier player.

DEAD.—A ball lying so near to the hole that the putt is a certainty. If a ball does not move after landing, it is termed a "dead ball."

FOG.—Tall grass, moss, etc.

FORE.—The warning shouted to any person who obstructs the desired stroke.

HANGING BALL.—One that rests on a downward slope.

HEEL.—The portion of the head of a club nearest to the shaft. Also a stroke at the ball with this part of the head.

HOLE.—These are four inches in diameter and lined with iron. On the first half of the course these holes are marked with white flags, and on the second with red flags.

HONOR.—The privilege of playing first from the tee.

LOFT.—To drive the ball high into the air.

LONG ODDS.—When the player needs at least a stroke more than his opponent to reach the hole.

MISSING THE GLOBE.—Failure to hit the ball. This is counted as a stroke.

NOSE.—The front end of the club-head, opposite the heel.

ODDS.—Generally, the handicap advantage that a good player gives to a poorer one. Sometimes this means one or more holes granted at the start, or a stroke per hole, or more than one stroke, or a stroke on every alternate hole. Odds at golf, as in billiards or pool, may be arranged on any scale that tends to equalize skill and results. The term "odds" applies also when the opponent has played one or more strokes than the player.

PRESS.—The endeavor to recover lost ground by unusually hard hitting. Avoid it.

RUB ON THE GREEN.—Either a successful or unsuccessful knock to the ball involving no penalty.

STANCE.—The position of the player's feet when ready for a stroke.

STEAL.—The holing of what seems to be an improbable putt.

STYMIE.—This term is used when your adversary's ball is in line with your own putt.

SWIPE.—A heavy driving stroke.

TOP.—Hitting the ball above its centre.

LAYING OUT A GOLF GREEN

Many a newly organized golf club has found that the laying out of a green as it should be done is not an easy matter. Much time and money are wasted by the attempts of comparatively inexperienced players who think—but who only think—that they know just how to plan a green that will meet all the requirements of, and furnish all the fair hazards of, this kingly game.

No club can hope to get a fair share of enjoyment out of the sport, or to attract visiting enthusiasts from other organiza-

tions, unless its green is above the average in excellence of arrangement.

The links of a club are generally placed in the charge of a body of its members known as the Greens Committee. It is a duty of this committee to keep the grounds at the highest standard, and members should hold the committee to strict accountability.

When the members of the committee do not thoroughly understand what is required of them they should consult an amateur of acknowledged high standing in the golf world. When the finances of the club permit, it is far better to communicate with the management of one of the large wholesale sporting goods houses that supply golf materials. Every such house is certain to have in its employ a man who is thoroughly experienced in the proper laying out of greens. In the end, it will be found cheaper to make use of his services. Nearly all of the smaller clubs in this country have had the initial experience of laying out greens badly, and the subsequent experience of having to pay an expert more than his work would have cost in the first place.

Even after the green has been unexceptionably arranged there is still much work for the expert to do. There are many more things needed in the game than are dreamed of in the beginner's philosophy. There are different kinds of balls, a vast variety of clubs, teeing plates, rubber and paper tees, ball cleaners, golf spikes, badges for caddies, pocket score books and club score books, practicers, golf gloves, caddie bags, marking disks, direction flags, marking flags, and so on, until the club of beginners is bewildered at the array of articles required on links which their owners wish to have considered first-class.

In settling all these perplexing points the expert from the wholesale house will be found in the end to be invaluable. No new club can do better than to have such an adviser on hand for a week or ten days.

After the green has been laid out in the most approved fashion, and all the really necessary paraphernalia have been bought, the club, unless it includes some exceptionally fine players in its membership should next secure the services of a professional teacher of the game. Good style can not be picked up from mere practice and experiment; it must be acquired from those who already possess it.

Nor must the members of a new club, after putting themselves in the hands of a skilled teacher, expect to begin at once to play the complete game. A competent teacher's judgment may be safely followed, and, except in the cases of prodigies, he prefers to devote some days of instruction first of all to such seemingly simple matters as the proper way to stand, the proper way to address the ball, and the simplest, most effective ways of making the strokes.

RULES FOR PLAYING CRICKET

SINGLE WICKET

THE BALL must weigh not less than 5½ ounces, nor more than 5¾ ounces. It must measure not less than 9¼ inches in circumference.

THE BAT must not exceed 4½ inches in the widest part; it must not be more than 38 inches in length.

THE STUMPS must be three in number, 27 inches out of the ground; the bails 8 inches in length; the stumps of equal and sufficient thickness to prevent the ball from passing through.

THE BOWLING-CREASE must be in a line with the stumps, 6 feet 8 inches in length, the stumps in the centre, with a return-crease at each end toward the bowler at right angles.

THE POPPING-CREASE must be 4 feet from the wicket, and parallel to it; unlimited in length, but not shorter than the bowling-crease.

THE WICKETS must be pitched opposite to each other by the umpires, at the distance of 22 yards.

THE BOWLER shall deliver the ball with one foot on the ground behind the bowling-crease and within the return-crease, and shall bowl four balls before he change wickets, which he shall be permitted to do only once in the same innings.

The ball must be bowled. If thrown or jerked, it is *"no ball."*

If the bowler shall toss the ball over the striker's head, or bowl it so wide that in the opinion of the umpire it shall not be fairly within the reach of the batsman, he shall adjudge one run to the party receiving the innings, which shall score

"wide ball." But if the batsman shall by any manner of means bring himself within reach of the ball, the run shall not be adjudged.

If the bowler deliver a "no ball" or a "wide ball," the striker shall be allowed as many runs as he can get, and he shall not be put out, except by running out. In the event of no run being obtained by any other means, then one run shall be added to the score of no balls, or wide balls, as the case may be. All runs obtained for wide balls to be scored for wide balls. If the ball shall first touch any part of the striker's dress or person, except his hands, the umpire shall call *"leg-bye."*

At the beginning of each innings the umpire shall call *"Play!"* From that time to the end of each innings no trial ball shall be allowed to any bowler.

THE STRIKER IS OUT (1) if either of the bails be bowled off; (2) if a stump be bowled out of the ground; (3) if the ball, from the stroke of the bat or hand be held before it touch the ground, although it be hugged to the body of the catcher; (4) if, in striking, or any other time while the ball shall be in play, both his feet shall be over the popping-crease and his wicket put down, except his bat be grounded within it; (5) if, in striking at the ball, he hit down his wicket; (6) if, under pretence of running or otherwise, the striker prevent a ball from being caught; (7) if the ball be struck and he wilfully strike it again; (8) if, in running, the wicket be struck down by a throw, or by the hand or arm (with ball in hand), before his bat (in hand) or some part of his person be grounded over the popping-crease. But, if both the bails be off, a stump must be struck out of the ground; (9) if any part of the striker's dress knock down the wicket; (10) if the striker touch or take up the ball while in play, unless at the request of the opposite party; (11) if with any part of his person he stop the ball, pitched in a straight line from the bowler's wicket to the striker's wicket, and would have hit.

If the players have crossed each other, he that runs for the wicket which is put down is out.

A ball being caught, no run shall be reckoned.

A striker being out, that run which he and his partner were attempting shall not be reckoned.

If a *lost ball* be called, the striker shall be allowed six runs; but if more than six shall be called, then the striker shall have all that have been run.

If any fieldsman stop the ball with his hat, the ball shall be considered *dead,* and the opposite party shall add five runs to their score; if any be run, they shall have five in all.

The ball having been hit, the striker may guard his wicket with his bat, or with any part of his body except his hands.

The wicket-keeper shall not take the ball for the purpose of stumping until it shall have passed the wicket; he shall not move until the ball be out of the bowler's hand; he shall not by any noise incommode the striker; and if any part of his person be over or before the wicket, although the ball hit it, the striker shall not be out.

THE UMPIRES are the sole judges of fair or unfair play, and all disputes shall be determined by them, each at his own wicket. They shall pitch fair wickets, and the parties shall toss up for choice of innings.

They shall allow two minutes for each striker to come in, and ten minutes between each innings, when the umpire shall call "play." The party refusing to play shall lose the match.

They are not to order a striker out, unless appealed to by the adversaries.

But if one of the bowler's feet be not on the ground behind the bowling-crease and within the return-crease when he shall deliver the ball, the umpire at his wicket, unasked, must call "no ball."

If either of the strikers run a short run, the umpire must call "one short."

After the delivery of four balls the umpire must call "over," but not until the ball shall be finally settled in the wicket-keeper's hands: the ball shall then be considered dead.

The players who go in second shall follow their innings if they have obtained 80 runs less than their antagonists, except in all matches limited to only one day's play, when the number of runs shall be limited to 60 instead of 80.

When one of the strikers shall have been put out, the use of the bat shall not be allowed to any person until the next striker shall come in.

THE LAWS OF SINGLE WICKET

(1) When there shall be less than five players on a side, bounds shall be placed 22 yards each in a line from the off and leg stump.

(2) The ball must be hit before the

bounds, to entitle the striker to run, which run can not be obtained unless he touch the bowling-stump or crease in a line with his bat, or some part of his person, or go beyond them, returning to the popping-crease.

(3) When the striker shall hit the ball, one of his feet must be on the ground and behind the popping-crease; otherwise the umpire shall call "*no hit.*"

(4) When there shall be less than five players on a side, neither *byes* nor *overthrows* shall be allowed; nor shall the striker be caught out behind the wicket, nor stumped out.

(5) The fieldsman must return the ball so that it shall cross the play between the wicket and the bowling-stump, or between the bowling-stump and the bounds; the striker may run till the ball be so returned.

(6) After the striker shall have made one run, if he start again, he must touch the bowling-stump and turn before the ball cross the play, to entitle him to another.

(7) The striker shall be entitled to three runs for *lost ball*, and the same number for ball stopped with bat.

(8) When there shall be more than four players on a side, there shall be no bounds. All hits, byes, and overthrows shall then be allowed.

Single wicket is chiefly valuable in absence of sufficient players to form an adequate field at double wicket. It is so inferior in interest to double wicket, that it is hardly ever played, unless when the latter is impracticable.

A good game at single wicket, though, where only a few players have met for practice, is far better than the desultory knocking about which is usual on such occasions. For a player deficient in driving and forward hitting of all kinds the practice it affords is invaluable, and to such a good course of single wicket is strongly recommended.

OBSERVATIONS ON RULES

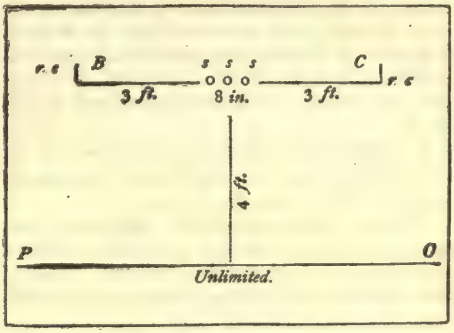
The accompanying diagram will explain the arrangement of the various creases, which are usually marked out on the turf with a mixture of chalk or whiting and water.

It is well to practice always with the creases duly marked, as the mind thus forms a habit of conformity to them, and the player is not embarrassed by the necessity of keeping a watch over his feet as well as over the ball.

The purposes of the several creases are as follows:

The BOWLING-CREASE marks the nearest spot to the striker from which the bowler may deliver the ball.

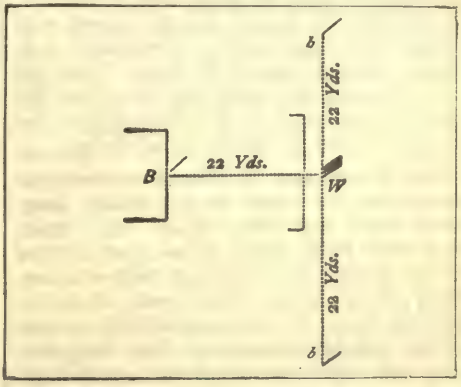
The RETURN-CREASE prevents the bowler from delivering the ball at an unreasonable distance laterally from the wicket; and the



s s s, the stumps (the three together forming the *wicket*); *B C*, the bowling-crease; *r c*, the return-crease; *P C*, the popping-crease

two together mark out within sufficiently exact limits the precise spot from which the striker may expect the ball.

The POPPING-CREASE, while giving the striker ample space to work in, puts a check upon any attempt to get unduly forward to meet the ball; it forms, too, a dis-



B, the bowling-stump, crease, etc.; *W*, the wickets with popping-crease, as in double wicket; *b b*, the boundaries

tinct and convenient mark by which to judge of a man's being on his ground, and of his having run the requisite distance between wickets. It is unlimited, to avoid the confusion between strikers and fieldsmen, which must inevitably be of constant recurrence were the strikers required to run directly from wicket to wicket.

The thickness and weight of a bat are left to the fancy and capacity of the player. In general, a tall man can use a heavier bat than a short one. About two pounds is a fair weight for a player of middle height.

Although it is a great mistake to play with too heavy a bat—for nothing so cramps the style, and does away with beautiful wrist-play—yet extreme lightness is still more to be deprecated: it is useless for hard hitting, and can therefore do little in the way of run-getting against a good field.

The points most to be looked for in a bat are these: First, weight suited to the player.

Secondly, good thickness of wood at the drive and lower end of the bat, *i.e.*, at the last six inches or so.

Thirdly, balance. Badly balanced bats give a sensation as of a weight attached to them when they are wielded, while a well-balanced one plays easily in the hand.

The *handle* is a very important consideration. Cane handles, pure and simple, or in composition with ash or other materials, are the best: some prefer oval handles, some round. The handle should, at least, be as thick as the player can well grasp: a thick handle greatly adds to the driving power of the bat; it is also naturally stronger, and therefore more lasting.

In choosing wickets, attention must be paid to two points: first, that each stump be perfectly straight; and, secondly, that it be free from flaws or knots. The least weakness is sure to be found out sooner or later.

Great attention should be paid to the bails, that they are exactly of the right size, especially that they are not too long. The least projection beyond the groove in the stump may make all the difference between "out" and "not out"—between, perhaps, winning a match and losing it.

THE LEAGUE RULES FOR BASEBALL

THE BALL must weigh not less than 5 ounces and not more than 5¼ ounces, and must measure not less than 9 and not more than 9¼ inches in circumference.

THE BAT must be made wholly of wood, except that the handle may be wound with twine or coated with a granulated substance, not to exceed 18 inches from the end. It must be round, not more than 2¾ inches in diameter at the thickest part, nor may it exceed a length of 42 inches.

THE BASES must be four in number, and designated as first base, second base, third base, and home base. The home base must be 12 inches square and so fixed in the ground as to be even with the surface, and so placed in the corner of the infield that two of its sides will form part of the infield boundaries. The first, second, and third bases must be canvas bags, 15 inches square, filled with some soft material, and so placed that the centre of the second base shall be upon its corner of the infield, and the centre of the first and third bases shall be on the lines running to and from second base, and 7½ inches from the foul lines, each base entirely within the foul lines.

THE FOUL LINES must be drawn in straight lines from the outer corner of the home base, along the outer edge of the first and third bases, to the boundaries of the ground.

THE PITCHER'S LINES must be straight, forming the boundaries of a space in the infield, 5½ feet long by 4 feet wide, distant 50 feet from the centre of the home base, and so placed that the 5½-foot lines will each be 2 feet distant from and parallel with a straight line passing through the centres of the home and second bases. Each corner of this space must be marked by a flat, round plate, 6 inches in diameter, fixed in the ground even with the surface.

THE BATSMAN'S LINES must be straight, forming the boundaries of a space on the right and of a similar space on the left of the home base, 6 feet long by 4 feet wide, extending 3 feet in front of and 3 feet behind the centre of the home base, and with its nearest line distant 6 inches from the home base.

THE PLAYERS of each club in a game shall be nine in number, one of whom shall act as captain, and in no case shall less than nine men be allowed to play on each side. No player shall attach anything to the sole or heel of his shoes other than the ordinary baseball shoe plate.

THE PITCHER shall take his position fac-

ing the batsman with feet square on the ground and in front of the pitcher's plate; but when delivering the ball to the bat one foot must touch the plate; nor shall he raise either foot, except at delivery, or take more than one step then. Should the pitcher throw the ball to any save the catcher, except to retire a base-runner, while the batsman is ready, each ball so thrown shall be called a ball, as also a delay exceeding twenty seconds in delivering to bat. A fair ball is a ball delivered by the pitcher while standing wholly within the lines of his position, facing the batsman; being so delivered as to pass over the home base, not lower than the batsman's knee, nor higher than his shoulder, provided a ball so delivered that touches the bat of the batsman in his position shall be considered a batted ball, and in play. An unfair ball is a ball delivered by the pitcher, as above, except that it does not pass over the home base or does pass above the batsman's shoulder, or below the knee. A balk is any motion made by the pitcher to deliver the ball to the bat without delivering it, and shall be held to include (1) any and every accustomed motion with the hands, arms, or feet, or position of the body assumed by the pitcher in his delivery of the ball and any motion calculated to deceive a base-runner, except the ball be accidentally dropped; (2) the holding of the ball by the pitcher so long as to delay the game unnecessarily; (3) any motion to deliver the ball, or the delivering the ball by the pitcher when any part of his person is upon ground outside of the lines of his position, including all preliminary motions with the hands, arms, and feet.

A Dead Ball is one that, delivered by the pitcher, touches any part of the batsman's person or clothing while standing in his position without being struck at; or any part of the umpire's person or clothing while on foul ground, without first passing the catcher. In case of a foul strike, foul hit ball, not legally caught out, dead ball, or base-runner put out for being struck by a fair hit ball, the ball shall not be considered in play until it is held by the pitcher standing in his position. A block is a batted or thrown ball that is stopped or handled by any person not engaged in the game. Whenever a block occurs the umpire shall declare it, and base-runners may run the bases, without being put out, until the ball has been returned to and held by the pitcher standing in his position. In the case of a block, if the person not engaged in the game should retain possession of the ball, or throw or kick it beyond the reach of the fielders, the umpire should call "Time," and require each base-runner to stop at the last base touched by him until the ball be returned to the pitcher standing in his position.

A Game shall consist of nine innings to each contesting nine, except that (1) if the side first at bat scores less runs in nine innings than the other side has scored in eight innings, the game shall then terminate; (2) if the side last at bat in the ninth inning scores the winning run before the third man is out, the game shall terminate; and (3) if the umpire calls "Game" on account of darkness or rain at any time after five innings have been completed, the score shall be that of the last equal innings played, unless the side second at bat shall have scored more runs than the side first at bat, in which case the score of the game shall be the total number of runs made.

The Batsman is Out if he fails to take his position at the bat in his order of batting, unless the error be discovered and the proper batsman takes his position before "at bat" is recorded; and in such case the balls and strikes called must be counted in the time at bat of the proper batsman. This rule shall not take effect unless *the out* is declared before the ball is delivered to the succeeding batsman: (1) if he fails to take his position within one minute after the umpire has called for the batsman; (2) if he makes a foul strike; (3) if he attempts to hinder the catcher from fielding or throwing the ball, by stepping outside the lines of his position, or otherwise obstructing or interfering with that player; (4) if, while the first base be occupied by a base-runner, three strikes be called on him by the umpire, except when two men are already out; (5) if, while making the third strike, the ball hits his person or clothing; (6) if, after two strikes have been called, the batsman obviously attempts to make a foul hit.

The Batsman becomes a Base-Runner instantly (1) after he makes a fair hit; (2) after four balls have been called by the umpire; (3) after three strikes have been declared by the umpire; (4) if, while he be a batsman, his person—excepting hands or forearm, which makes it a dead ball—or clothing be hit by a ball from the pitcher, unless, in the opinion of the um-

pire, he intentionally permits himself to be so hit; or interference by the catcher prevents him from striking the ball.

THE BASE-RUNNER shall be entitled, without being put out, to take the base in the following cases: (1) if, while he was batsman, the umpire called four balls; (2) if the umpire awards a succeeding batsman a base on four balls, or for being hit with a pitched ball, or in case of an illegal delivery, and the base-runner is thereby forced to vacate the base held by him; (3) if the umpire calls a "balk"; if a ball delivered by the pitcher pass the catcher and touch the umpire or any fence or building within ninety feet of the home base; (4) if upon a fair hit the ball strikes the person or clothing of the umpire on fair ground; (5) if he be prevented from making a base by the obstruction of an adversary; (6) if the fielder stop or catch a batted ball with his hat, or any part of his dress.

The base-runner shall return to his base, and shall be entitled to so return without being put out, (1) if the umpire declares a foul tip or any other foul hit not legally caught by a fielder; (2) if the umpire declares a foul strike; (3) if the umpire declares a dead ball, unless it be also the fourth unfair ball, and he be thereby forced to take the next base; (4) if the person or clothing of the umpire interferes with the catcher, or he is struck by a ball thrown by the catcher to intercept a base-runner.

THE UMPIRE shall not be changed during the progress of a game, except for reason of illness or injury. The umpire is master of the field from the commencement to the termination of the game, and is entitled to the respect of the spectators. Any person offering any insult or indignity to him must be promptly ejected from the grounds. He must compel the players to observe the provisions of all the playing rules, and be invested with authority to order any player to do or omit any act, as he may deem necessary. The umpire is the sole and absolute judge of play. In no instance shall any person be allowed to question the correctness of any decision made by him on a play, and no player shall leave his position in the field, his place at the bat, on the bases or players' bench, to approach or address the umpire, except on an interpretation of the playing rules, and only that shall be done by the captains of the contending nines.

Before the commencement of a game, the umpire shall see that the rules governing all the materials of the game are strictly observed. He must keep the contesting nines playing constantly from the commencement of the game to its termination, allowing such delays only as are rendered unavoidable by accident, injury, or rain. He must, until the completion of the game, require the players of each side to promptly take their positions in the field as soon as the third man is put out, and must require the first striker of the opposite side to be in his position at the bat as soon as the fielders are in their places. The umpire shall count and call every "unfair ball" delivered by the pitcher, and every "dead ball," if also an unfair ball, as a "ball," and he shall also count and call every "strike." Neither a "ball" nor a "strike" shall be counted or called until the ball has passed the home base. He shall also declare every "dead ball," "block," "foul hit," "foul strike," and "balk."

AMERICAN REGULATIONS FOR FOOTBALL

FOOTBALL, like baseball, requires two opposing sides, or "teams." It is played with a ball of leather, inclosing an inflated rubber bladder, and in shape is a prolate spheroid. The goals are placed at either end of the field, and each side is to defend its own goal, while trying to drive the ball through its opponents' goal.

RULES

THE GROUND.—The game is played upon a field of 330 feet length and 160 feet width, the inclosure to be marked upon the ground in heavy white lines with lime. The lines at the two ends are called goal lines, and the side lines extend beyond their intersection with the goal lines. The goals, placed in the middle of each goal line, consist of two upright posts not more than twenty feet high, and eighteen feet and six inches distant from each other. Ten feet from the ground is a horizontal cross-bar. Five-yard lines, parallel with the goal lines, are laid the entire length of the field. The game is played by two teams of eleven men each. The officials of

the game are a referee, an umpire, and a linesman.

A Drop Kick is made by dropping the ball and kicking it as it rises from the ground; a place kick, by kicking the ball, after it has been placed on the ground; a punt, by letting the ball fall and kicking it before it strikes the ground. A kick-off is a place kick from the centre of the field, and a goal can not be scored thereby; a kick-out is a drop, place, or punt by a player of the side that makes a safety or a touchback; a free kick means any kick when the rules prevent the opponents from advancing beyond a certain point. The free kick includes a kick-off, kick-out, punt-out, kick from a fair catch, and place kick for goal after touchdown.

The Game consists of two halves, each of 35 minutes' duration. The two sides toss up a coin, the winner choosing either goal or kick-off. Line-up is effected by one of the players of the side having the kick-off placing the ball in the exact centre of the field, the opponents standing in their own territory, at least ten yards from the ball until it has been touched by the foot. Each team of eleven men consists of seven forwards, a quarter-back, two half-backs, and a goal-tend. One of the forwards of the side having the ball kicks it at least ten yards into the opponents' territory. Upon catching the ball, one of the opponents returns it by kick, or runs with it. If a player runs with the ball he is tackled by his opponents.

Ball Down.—When the player with the ball is fairly held, the referee blows his whistle, and the ball is "down." At the spot of holding, the ball is placed on the ground for a "scrimmage." Both sides must line up on their own side of the ball. One of the forwards of the team holding the ball kicks or snaps back. As soon as the ball is in motion both sides may press forward. A team is "off side" that is between the ball and opponents' goal; the other team is "on side." The side having the ball may not use their hands or arms to obstruct opponents.

When a side, after three successive "downs," fails to advance the ball five yards, or is obliged to retreat twenty yards, that side gives up the ball.

The Free Kick.—If a player catches the ball, when kicked by his opponents, this is termed "a fair catch." He must hold up the ball and plant one heel to mark the spot. His side is then entitled to a free kick, and opponents must not come within ten yards until the ball is in motion.

"Out of Bounds" is when the ball goes across the side lines of the field. It must be brought back at the point at which it crossed the line at least five yards into the field, and not more than fifteen, and another "scrimmage" follows.

Touchdown and "Safety."—When the ball is carried across the goal line by the assailants it is termed a "touchdown," and counts five points, besides entitling the side accomplishing it to have a try for a goal kick. If the ball is then kicked between the goal-posts, and over the cross-bar, this is a goal, and adds one more to the score. A "safety touch" may be made sometimes by the side defending the goal. This consists in carrying the ball back of the defenders' own goal line, and counts two points for the opponents. In some cases it is better to make a "safety" than to risk allowing the enemy to score a "touchdown." A drop-kick for goal, if successful, counts five points.

Tackling.—There shall be no striking or unnecessary roughness, nor any tripping. Tackling below the knees is prohibited.

Direction of a Game.—The referee has general charge of the game, sees that the ball is put in play, and is judge of its position and progress; he is also sole authority as to the score of the game. The umpire is responsible for the enforcement of all rules whose infraction calls for a distance penalty or the surrender of the ball, and is judge of the conduct of the players. The linesman, who is under the orders of the referee, marks the distances gained or lost with the ball. He must give testimony to either of the other officials, and the umpire is required to give testimony to the referee.

THE LAWS OF LAWN-TENNIS

FOR THE SINGLE-HANDED GAME the court is 27 feet in width, and 78 feet in length. It is divided across the middle by a net, the ends of which are attached to the tops of the two posts, each placed 4½ feet from the inner side-line on the outside the court. The height of the net is 3 feet 6 inches at the posts and 3 feet at the centre. At each end of the court parallel with the net, and at a distance of 39 feet from it, are drawn the base-lines, the extremities of which are connected by the side-lines. Half-way between the side-lines and parallel with them is drawn the half-court-line, dividing the space on each side of the net into two equal parts, called the right and left courts. On each side of the net, at a distance of 21 feet from it, and parallel with it, are drawn the service-lines.

The larger margin there is around the court the better; but at least there should be 12 feet clear on each side, and 21 feet at each end.

The choice of sides and the right of serving during the first game shall be decided by toss; provided (1) that if the winner of the toss choose the right to serve, the other shall have the choice of sides, and *vice versa;* and (2) that the winner of the toss may, if he prefer it, require the other player to make the first choice.

The players shall stand on opposite sides of the net; he who first delivers the ball being called the server, the other, the striker-out.

At the end of the first game, the striker-out shall become server, and the server shall become striker-out; and so on alternately throughout the set.

The server shall stand with one foot further from the net than the base-line, and with the other foot upon the base-line, and shall serve from both courts alternately, beginning from the right.

The ball served must drop within the service-line, half-court-line, and side-line of the court, diagonally opposite to that from the point of service, or upon any such line.

It is a *fault* (1) if the service be delivered from the wrong court; (2) if the server do not stand as directed; (3) if the ball drop in the net or beyond the service line; (4) if it drop out of the court or in the wrong court.

After a *fault* the server shall serve again from the same court, unless it was a *fault* because served from the wrong court.

A *fault* may not be claimed after the next service has been delivered.

The service may not be volleyed (*i.e.* taken before it touches the ground).

The server shall not serve until the striker-out is ready; but if the latter attempt to return the service, he shall be deemed ready.

A ball is *in-play* from the moment it is served (unless a fault), until (1) it has been volleyed by the striker-out in his first stroke, or (2) has dropped in the net, or out of court; or (3) has touched either of the players or anything he carries, except his racket in the act of striking; or (4) has been struck by either of the players with his racket more than once consecutively; or (5) has been volleyed before it has passed over the net; or (6) has failed to pass over the net before its first bound; or (7) has touched the ground twice consecutively on either side of the net, though the second time may have been out of court.

It is a *let* if (1) the ball touch the net, provided the service be otherwise good; or (2) if a service or fault be delivered when the striker-out is not ready; or (3) if either player be prevented by an accident from serving or returning the ball *in-play*. In case of a *let* the service or stroke counts for nothing, and the server shall serve again.

The server wins a stroke if (1) the striker-out volley the service; or (2) fail to return the service or the ball *in-play* (except in the case of a *let*); or (3) return the service or ball *in-play*, so that it drop outside any of the lines which bound his opponent's court; or (4) otherwise lose a stroke.

Either player loses a stroke (1) if the ball *in-play* touch him, or anything he wears or carries, except his racket in the act of striking; or (2) if he touch or strike the ball *in-play* with his racket more than once consecutively; or (3) if he touch the net or any of its supports while the ball is *in-play;* or (4) if he volley the ball before it has passed the net.

The first stroke won by either player scores 15 for him, or *love* for his opponent. In announcing, the server's score is always put first, thus: if the server wins the point it is "15 love," if he loses, it is "love 15," etc. On either player winning his second stroke, his score is called 30; his third stroke, 40; his fourth stroke, "game."

If, however, both players have won three strokes, the score is "deuce"; and the next

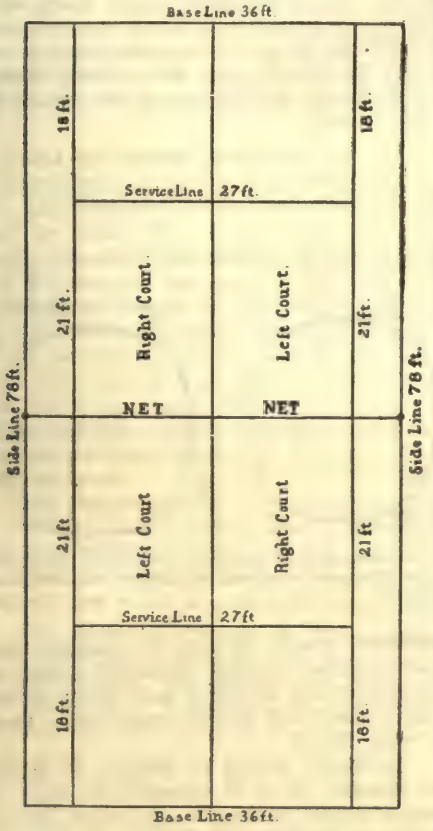


Diagram of a Lawn Tennis Court as at present laid out for both double and single-handed games. This court is designed particularly for the double-handed game, but the single-handed game may be played on it, provided the rules be observed.

stroke won by either is scored "advantage." If the same player win the next stroke, it is "game"; if he lose the next stroke, the score is again "deuce"; and so on, until either player wins the two strokes immediately following "deuce."

The player who first wins six games wins a set, unless each has won five games, which scores "games-all." The next game won by either scores "advantage game," and if the same player win the next game, he wins the set; if he lose the next game, the score is again "games-all"; and so on until either wins the two games immediately following "games-all," when he wins the set.

The players shall change sides at the end of every set; but the umpire, on appeal from either before the toss for choice, shall direct a change of sides at the end of the first, third, and every alternate game of each set, provided that the players shall not change sides, at the end of a set of an even number of games.

When a series of sets is played, the player who was server in the last game of one set shall be striker-out in the first game of the next.

For the Three-Handed and Four-Handed Games, the same court is at present in general use. Within the side-lines, and four and one-half feet from them, and parallel with them, are drawn the service side-lines.

In the three-handed tennis, the single player serves in every alternate game.

In the four-handed game, the pair who have the serve in the first game may decide which shall take it, and the opposing pair may decide for the second game. The partner of the server in the first game shall serve in the third; the partner of the server in the second game shall serve in the fourth, etc.

The players shall take the service alternately throughout each game; no player shall receive or return a service delivered to his partner; and the order of service and of striking-out, once arranged, shall not be altered, nor shall the strikers-out change courts to receive the service before the end of the set.

The ball served must drop within the service-line, half-court-line and service side-line of the court, diagonally opposite to that from which it was served, or upon any such line.

It is a *fault* if (1) the ball served do not drop as already provided, or (2) if it touch the server's partner, or anything he wears or carries.

If a player serve out of his turn, the umpire, as soon as the mistake is discovered, shall direct the proper player to serve; but all strokes score also any *fault* already served.

A racket should not be strung too tightly; one can generally tell at once whether the stringing is too loose, but it is neces-

sary to play with a racket half a dozen times or so before one can feel whether there is sufficient "give" in the strands to make it a good driver.

The first important point is to hold the racket at the extreme end, and not halfway up the handle. It should be firmly, but not tightly, grasped. Do not move your arm stiffly from the shoulder, but learn to use the elbow and wrist joints. This is a matter of considerable importance to grace and efficiency in playing. Keep a good distance off the ball, and stand well back in the court.

Hit the ball in the centre of the racket, with such elevation as will carry it over the net and well into the back of the court. The nearer the ball is played to the top of the net the more difficult will it be to return, but such strokes can be made with certainty only after much practice. The great trouble for beginners is to get the ball over the net. When a ball drops short never run forward and hit it very hard, or with exactly the same strength as if it had fallen on the base-line. Always think of the position in court and regulate the strength of the stroke accordingly.

There are two ways in which a ground-stroke may be taken, namely, at the top of the bound, and again when the ball is near the ground.

In service, never have less than two balls in your hand, as you are more likely to serve a double-fault if you wait to pick up a second ball.

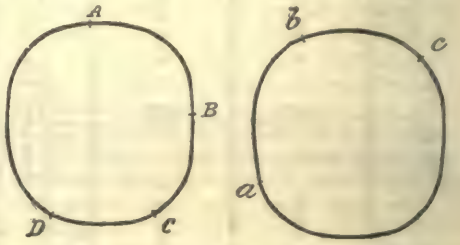
It is generally better to serve from near the middle of the back-line rather than from the extreme corner, as is frequently done for two reasons: (1) because the former position exposes a larger portion of the opposite court into which to serve, consequently with less liability to a fault; (2) because the middle of the court is a better position to take the return, which otherwise your opponent can easily place where you will find it impossible to get up to it in time.

Your position in the court is of much importance. Stand well back in the court, near the base-line, and rather to the left of the court. If in the left court in a double game, stand near the outside line, otherwise your opponent may place the ball to your left, where it will be difficult for you to reach it in time. After making a stroke that takes you away from your ground, always get home again directly, to be ready for the return.

Take the racket in the left hand by the splice, the blade being vertical and the handle horizontal.

FOR THE FOREHAND STROKE (the figure being a vertical section of the handle) the base of the right hand will just overlap the butt; the knuckle of the thumb will be at A; the knuckle of the forefinger at B; the bend of the first joint of the forefinger at C, and of the second joint at D. The first joint will slope toward the blade, the other joints away from the blade; the thumb will slope very slightly toward the blade, its last joint jutting out from the handle, the first joints of the other fingers will lie across the handle at right angles.

FOR THE BACKHAND STROKE the knuckle of the thumb will be at A; the knuckle of the forefinger at B, and the bend of the first joint at C. The slope of the fingers will be exactly the same as in the



Diagrams of cross-sections of the racquet handle, indicating manner of holding for forehand and backhand strokes.

forehand stroke; in fact, the change from the forehand to the backhand stroke is simply turning the hand back in the direction of the body, through rather more than a right angle.

The racket should be grasped as firmly as possible, if it is intended to make a severe stroke; it may be held more loosely for a gentle one.

When about to make a forehand stroke the feet should be apart, the left foot being slightly in front. The racket is swung back behind the shoulder to an extent varying with the strength of the stroke to be made; the weight of the body being on the right foot. In the act of striking, the weight is transferred to the left foot; the body is bent forward, and the left knee is bent.

For the backhand stroke the right foot is in front; the body is turned sidewise to allow a clear swing for the arm; the

weight is first on the left foot, and then transferred to the right.

The left arm should be kept quiet, and not waved about in the air.

The ball may be, and sometimes must be, taken at all sorts of different heights, but the one which lends itself best to a good stroke is from about two feet to a foot and a half from the ground when the ball is falling; the position of the arm and racket will of course vary with the height at which the ball is taken. In making this stroke, the arm must be rather stiff.

After knowing how to strike the ball, the next point is to acquire what is known as a good length—that is to say, the power of propelling the ball to a point as near the opposite base-line as possible.

Good length is the most important branch of the art of placing, which consists of putting the ball in that part of the court which is most inconvenient for the opponent to reach, and which he least expects. If a ball struck with a certain force drops, say within a foot of the base-line, it is almost impossible to make a stroke off it which an opponent will be unable to return. Not only does this involve the difficult task of making the ball travel a long distance, but the time which must elapse gives the opponent a very good chance of reaching his return.

RULES AND REGULATIONS IN CROQUET

A FULL-SIZED croquet ground should measure 40 yards by 30 yards. Its boundaries should be accurately defined.

The *Hoops* should be of half-inch round iron, and should not be more than 6 inches in width, inside measurement. The crown of the hoop should be at least 12 inches clear of the ground. A hoop with the crown at right angles to the legs is to be preferred.

The *Pegs* should be of uniform diameter of not less than 1½ inch, and should stand at least 18 inches above the ground.

The *Balls* should be of boxwood, and should not weigh less than 14 ounces each.

The FOUR-BALL GAME is recommended for adoption in preference to any other.

When odds are given, the *Bisque* is recommended. A bisque is an extra stroke which may be taken at any time during the game in continuation of the turn. A player receiving a bisque can not roquet a ball twice in the same turn without making an intermediate point. In other respects, a bisque confers all the advantages of an extra turn. A player receiving two or more bisques can not take more than one in the same turn. Passing the boundary, or making a foul strike, does not prevent the player taking a bisque.

The following *Settings* are recommended:

No. 1. *Eight-Hoop Setting.*—Distances on a full-sized ground: Pegs 3 yards from boundary; first and corresponding hoop 5 yards from pegs; centre hoops midway between first and sixth hoops and 5 yards from each other; corner hoops 6 yards from end of ground and 5 yards from side. Starting spot 2 feet in front of first hoop, and opposite its centre.

No. 2. *Seven-Hoop Setting.*—Distances on a full-sized ground: Pegs in centre line of ground 8 yards from nearest boundary. Hoops up centre line of ground 6 yards from peg and 6 yards apart; corner hoops 7 yards from centre and in a line with pegs. Starting spot 1½ yard from first hoop in centre line of ground.

No. 3. *Six-Hoop Setting.*—Distances on a full-sized ground as in No. 2, except the middle-line hoops 8 yards apart. Starting spot 1 foot from left-hand corner hoop, and opposite its centre.

It is essential to match play that bystanders should abstain from walking over the grounds, speaking to the players or the umpires, making remarks about them aloud or in any way distracting their attention.

DEFINITIONS

A *Point* is made when a hoop is run, or a peg is hit, in order.

The striker's hoop or peg *in order* is the one he has next to make.

A *Roquet* is made when the striker's ball is caused by a blow of the mallet to hit another which it has not before hit in the same turn since making a point.

The striker's ball is said to be *in play* until it roquets another. Having made roquet, it is *in hand* until croquet is taken. *Croquet* is taken by placing the striker's ball in contact with the one roqueted, the striker then hitting his own ball with the mallet. The non-striker's ball, when moved

by a croquet, is called the *croqueted ball.*

A *Rover* is a ball that has made all its points in order except the winning peg.

THE LAWS OF CROQUET

MALLETS.—There should be no restriction as to the number, weight, size, shape, or material of the mallets; nor as to the attitude or position of the striker; nor as to the part of the mallet held, provided the ball be not struck with the handle, nor the mace stroke used.

SIZE OF BALLS.—The balls used in match play shall be 3⅝ inches in diameter.

CHOICE OF LEAD AND OF BALLS.—It shall be decided by lot which side shall have choice of lead and of balls. In a succession of games the choice of lead shall be alternate, the sides keeping the same balls.

COMMENCEMENT OF GAME.—In commencing, each ball shall be placed on the starting spot (see SETTINGS). The striker's ball, when so placed and struck, is at once in play, and can roquet another, or be roqueted, whether it has made the first hoop or not.

STROKE, WHEN TAKEN.—A stroke is considered to be taken if a ball be moved in the act of striking; but should a player, in taking aim, move his ball accidentally, it must be replaced to the satisfaction of the adversary, and the stroke be then taken. If a ball be moved in taking aim, and then struck without being replaced, the stroke is foul (see FOUL STROKES).

HOOP, WHEN RUN.—A ball has run its hoop when, having passed through from the playing side and ceased to roll, it can not be touched by a straight-edge placed against the wires on the side from which it was played.

BALL DRIVEN PARTLY THROUGH HOOP.—A ball driven partly through its hoop from the non-playing side can not run the hoop at its next stroke, if it can be touched by a straight-edge placed against the wires on the non-playing side.

POINTS COUNTED TO NON-STRIKER'S BALL.—A ball driven through its hoop, or against the turning peg, by any stroke not foul, whether of its own or of the adverse side, counts the point so made.

POINTS MADE FOR ADVERSARY'S BALL.—If a point be made for an adversary's ball, the striker must inform his adversary of it. Should the striker neglect to do so, and the adversary make the point again, he may continue his turn as though he had played for his right point.

THE TURN.—A player, when his turn comes round, may roquet each ball once, and may do this again after each point made. The player continues his turn so long as he makes a point or a roquet.

CROQUET IMPERATIVE AFTER ROQUET.—A player who roquets a ball must take croquet, and in so doing must move both balls (see FOUL STROKES). In taking croquet, the striker is not allowed to place his foot on the ball.

BALL IN HAND AFTER ROQUET.—No point or roquet can be made by a ball which is in hand. If a ball in hand displace any other balls, they must remain where they are driven. Any point made in consequence of such displacement counts, notwithstanding that the ball displacing them is in hand.

BALLS ROQUETED SIMULTANEOUSLY.—When a player roquets two balls simultaneously, he may choose from which of them he will take croquet; and a second roquet will be required before he can take croquet from the other ball.

BALLS FOUND TOUCHING.—If at the commencement of a turn the striker's ball be found touching another, roquet is deemed to be made, and croquet must be taken at once.

ROQUET AND HOOP MADE BY SAME STROKE.—Should a ball, in making its hoop, roquet another that lies beyond the hoop, and then pass through, the hoop counts as well as the roquet. A ball is deemed to be beyond the hoop if it lies so that it can not be touched by a straight-edge placed against the wires on the playing side. Should any part of the ball that is roqueted be lying on the playing side of the hoop, the roquet counts, but not the hoop.

PEGGING OUT.—If a rover (except when in hand) be caused to hit the winning peg by any stroke of the same side, not foul, the rover is out of the game, and must be removed from the ground. A rover may similarly be pegged out by an adverse rover.

ROVER PEGGED OUT BY ROQUET.—A player who pegs out a rover by a roquet loses the remainder of his turn.

BALLS SENT OFF THE GROUND.—A ball sent off the ground must at once be replaced 3 feet within the boundary, measured from the spot where it went off, and at right angles to the margin. If this

spot be already occupied, the ball last sent off is to be placed anywhere in contact with the other, at the option of the player sending off the ball.

BALL SENT OFF NEAR CORNER.—A ball sent off within 3 feet of a corner is to be replaced 3 feet from both boundaries.

BALL TOUCHING BOUNDARY.—If the boundary be marked by a line on the turf, a ball touching the line is deemed to have been off the ground. If the boundary be raised, a ball touching the boundary is similarly deemed to have been off the ground.

BALL SENT OFF AND RETURNING TO GROUND.—If a ball be sent off the ground, and return to it, the ball must be similarly replaced, measuring from the point of first contact with the boundary.

BALL SENT WITHIN 3 FEET OF BOUNDARY.—A ball sent within 3 feet of the boundary, but not off the ground, is to be replaced as though it had been sent off—except in the case of the striker's ball, when the striker has the option of bringing his ball in, or of playing from where it lies.

BOUNDARY INTERFERING WITH STROKE.—If it be found that the height of the boundary interferes with the stroke, the striker, with the sanction of the umpire, may bring in the balls a longer distance than 3 feet, so as to allow a free swing of the mallet. Balls so brought in must be moved in the line of aim.

DEAD BOUNDARY.—If, in making croquet, the striker send his own ball, or the ball croqueted, off the ground, he loses the remainder of his turn; but if by the same stroke he make a roquet, his ball, being in hand, may pass the boundary without penalty. Should either ball while rolling after a croquet be touched or diverted from its course by an opponent, the striker has the option (see BALLS TOUCHED BY ADVERSARY), and is not liable to lose his turn should the ball which has been touched or diverted pass the boundary.

FOUL STROKES.—If a player make a foul stroke, he loses the remainder of his turn, and any point or roquet made by such stroke does not count. Balls moved by a foul stroke are to remain where they lie, or be replaced, at the option of the adversary. If the foul be made when taking croquet, and the adversary elect to have the balls replaced, they must be replaced in contact as they stood when the croquet was taken. The following are foul strokes:

(*a*) To strike with the mallet another ball instead of or besides one's own in making the stroke.

(*b*) To spoon, *i.e.*, to push a ball without an audible knock.

(*c*) To strike a ball twice in the same stroke.

(*d*) To touch, stop, or divert the course of a ball when in play and rolling, whether this be done by the striker or his partner.

(*e*) To allow a ball to touch the mallet in rebounding from a peg or wire.

(*f*) To move a ball which lies close to a peg or wire by striking the peg or wire.

(*g*) To press a ball round a peg or wire (crushing stroke).

(*h*) To play a stroke after roquet without taking croquet.

(*i*) To fail to move both balls in taking croquet.

(*k*) To croquet a ball which the striker is not entitled to croquet.

BALLS TOUCHED BY ADVERSARY.—Should a ball when rolling, except it be in hand, be touched, stopped, or diverted from its course by an adversary, the striker may elect whether he will take the stroke again, or whether the ball shall remain where it stopped, or be placed where, in the judgment of the umpire, it would have rolled to.

BALLS STOPPED OR DIVERTED BY UMPIRE.—Should a ball be stopped or diverted from its course by an umpire, he is to place it where he considers it would have rolled to.

PLAYING OUT OF TURN, OR WITH THE WRONG BALL.—If a player play out of turn, or with the wrong ball, the remainder of the turn is lost, and any point or roquet made after the mistake. The balls remain where they lie when the penalty is claimed, or are replaced as they were before the last stroke was made, at the option of the adversary. But if the adverse side play without claiming the penalty, the turn holds good, and any point or points made after the mistake are scored to the ball by which they have been made—that is, the ball is deemed to be for the point next in order to the last point made in the turn—except when the adversary's ball has been played with, in which case the points are scored to the ball which ought to have been played with. If more than one ball be played with during the turn, whether before or after the mistake, the points are scored to the ball last played with. Whether the penalty be

claimed or not, the adversary may follow with either ball of his own side.

Playing for Wrong Point.—If a player make a wrong point it does not count, and therefore—unless he have, by the same stroke, taken croquet, or made a roquet—all subsequent strokes are in error, the remainder of turn is lost, and any point or roquet made after the mistake. The balls remain where they lie when the penalty is claimed, or are replaced as they were before the last stroke was made, at the option of the adversary. But if the player make another point, or the adverse side play, before the penalty is claimed, the turn holds good; and the player who made the mistake is deemed to be for the point next in order to that which he last made.

Information as to Score.—Every player is entitled to be informed which is the next point of any ball.

State of Game, if disputed.—When clips are used, their position, in case of dispute, shall be conclusive as to the position of the balls in the game.

Wires knocked out of Ground.—Should a player, in trying to run his hoop, knock a wire of that hoop out of the ground with his ball, the hoop does not count. The ball must be replaced, and the stroke taken again; but if by the same stroke a roquet be made, the striker may elect whether he will claim the roquet or have the balls replaced.

Pegs or Hoops not Upright.—Any player may set upright a peg or hoop, except the one next in order; and that must not be altered except by the umpire.

Ball lying in a Hole or on Bad Ground.—A ball lying in a hole or on bad ground may be removed with the sanction of the umpire. The ball must be put back—*i.e.*, away from the object aimed at—and so as not to alter the line of aim.

Umpires.—An umpire shall not give his opinion, or notice any error that may be made, unless appealed to by one of the players. The decision of an umpire, when appealed to, shall be final. The duties of an umpire are—

(*a*) To decide matters in dispute during the game, if appealed to.

(*b*) To keep the score, and, if asked by a player, to disclose the state of it.

(*c*) To move the clips, or to see that they are properly moved.

(*d*) To replace balls sent off the ground, or to see that they are properly replaced.

(*e*) To adjust the hoops or pegs not upright, or to see that they are properly adjusted.

Absence of Umpire.—When there is no umpire present, permission to move a ball, or to set up a peg or hoop, or other indulgence for which an umpire would be appealed to, must be asked of the other side.

Appeal to Referee.—Should an umpire be unable to decide any point at issue, he may appeal to the referee, whose decision shall be final; but no player may appeal to the referee from the decision of an umpire.

FIRST AID TO THE INJURED

IN CONNECTION with the general subject of health, gymnastics and out-of-door athletic sports and exercises it is desirable to give at least passing attention to the subject of relieving the victims of accidental injuries and mishaps. While it is in no sense reasonable to encourage people to think that the treatment and cure of even the simplest maladies and accidental disorders can be undertaken by a person unlearned in medicine and surgery, there are certain things that intelligent information will enable any one to do in emergencies. It is, furthermore, most essential that information on these matters be as widely disseminated as possible, in order to alleviate suffering and contribute to the saving of many lives that would otherwise be sacrificed. The classes of accident that a well-informed person may relieve are such as result in fractures of the limbs, in unconsciousness from submersion in water and in bleeding at some artery.

TREATMENT FOR ACCIDENTAL INJURIES

BLEEDING WOUNDS

IN CASE of hemorrhage, or bleeding, as the result of a cut or some other cause that has broken the skin and tissues covering the blood vessels, the treatment to be given depends on the character of the wound and the amount of bleeding. Loss of blood is always disastrous, particularly if an artery be severed, but radical treatments, cutting off the entire supply from the limb, need not be applied unless the wound is of such a character as to preclude local applications, or unless such applications fail to check the flow.

LOCAL APPLICATIONS.—In many cases of hemorrhage from wounds in the limbs an effective method of stopping the blood is to lay the patient on his back, with the head slightly raised. Then, having elevated the injured limb to a higher level, bring the edges of the wound together, and apply a wet compress—a handkerchief folded into a pad—and bind it down tightly with another handkerchief or a strip of cloth passed around the limb and firmly secured.

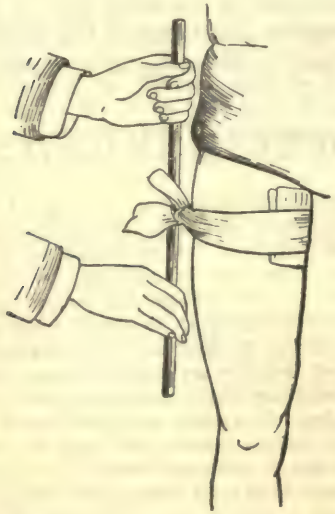
Cold water or ice, or water as hot as can be borne by the sufferer, are equally efficient in contracting the blood vessels in persistent bleeding. Warm or tepid water tends rather to increase the hemorrhage. It is not well for an unprofessional person to attempt any other measure of relief, such as holding the vessels with the fingers, etc., for the simple reason that only a precise knowledge of anatomy reveals the location, and guess work only causes unnecessary suffering.

BLEEDING FROM VEINS AND ARTERIES.—In case a wound has opened a vein, without cutting an artery also, the fact may be discovered by the color of the blood passed—dark red or purplish—and by the character of the flow—steady and uninterrupted. If an artery has been severed, the blood is a bright red color and spurts out in jets, as if under the impulse of a pump. This

is due to the fact that the blood *pumped* into the arteries by the heart moves by a number of successive impulses, as may be found in the pulses at the wrist or throat. Generally a wound severs both veins and arteries; so these tests fail.

SUMMARY TREATMENTS.—In case of persistent and copious bleeding from a wound in either arm or leg that may not be stopped by local pressure, as already described, summary methods may be used to cut off the blood supply from the limb. This operation consists in binding a hard substance—preferably a round flat stone—firmly at the point in the limb where the artery is nearest the surface. These points in both arm and leg, also the methods of applying the pressure, are shown in the accompanying figures.

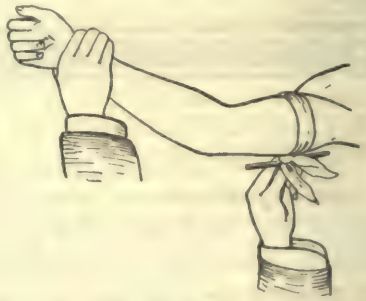
AN IMPROVISED TOURNIQUET.—To shut off the blood-supply from an artery, a flat stone of about the same size as a hen's egg should be wrapped in a folded handkerchief and pressed against the point where the main artery passes. On the arm, this point is midway between the shoulder and elbow, inside the biceps muscle, and on the



Showing method of bandaging an artery in the leg to stop bleeding at a wound, below the point of pressure.

leg, about an inch below the groin, somewhat forward on the inside of the limb. The pad being pressed firmly down is secured in place by a handkerchief, bandage strip, or a piece of soft rope, which is tied securely about the limb. A strong stick is then run under the bandage and used to twist it around tightly, so as to press the hard pad as tightly as possible against the flesh, thus constricting the artery. Of course, such compression, in order to be effective, must be applied between the bleeding wound and the heart.

WOUNDS IN THE BODY OR HEAD can be treated only by local compression, as already described, since it is impossible to



Showing method of bandaging an artery in the arm to stop bleeding at a lower point.

constrict the arteries beyond the bleeding point. With such injuries, however, it is useful to apply cold water or ice to stop the blood as much as possible. *In no case should a person, other than a surgeon, apply any drug or caustic substance at a bleeding point; since the use of such agents should be guided solely by experience and adequate knowledge.* Cold applications and pressure are the only means that should be employed by a layman in such cases.

FRACTURED BONES

In case of the fracture of a bone it is necessary to do nothing more than provide for the comfort of the patient, until the services of a surgeon may be secured. *It is not necessary to set the bone at once,* nor should the inexperienced hand attempt it under any circumstances that we need consider here.

FRACTURE OF A LEG.—If a person's leg is fractured at any place where the services of a surgeon may be speedily summoned, there is no need to do more than to lay him on his back, in as comfortable a position as possible, and remove all clothing or other articles that will press upon the injured limb. If it is necessary to move the patient, the two ends of the broken bone should be brought as nearly as possible to the normal position, with the exertion of no more force than is absolutely necessary, and with the steady avoidance of any movement that is liable to cause suf-

fering. The limb should then be wrapped in a pillow or in a cushion of the softest obtainable cloth stuffed with hay, grass, leaves or any other suitable substance. Splints of board, stick, or other strong substance, as long as, if not slightly longer than, the broken bone, should be secured to either side, outside of the pillow or cushion, and



Showing method of splinting a broken leg, when it is necessary to move the sufferer.

the whole made secure by cords or bandages passed around, as shown in the accompanying cut.

OTHER FRACTURES.—In all fractures, the main object of the provisional treatment is to prevent the two ends of the broken bone from rubbing against one another, or from lacerating the surrounding tissues. A broken forearm may be bandaged and splinted in the same fashion as has already been described for a broken leg. It should then be arranged in a sling hanging from the patient's neck. If the upper arm is broken, as happens less frequently, a similar treatment may be followed, so far as the splinting and bandaging are concerned, but the patient had best be carried on a stretcher, in order to avoid unnecessary irritation of the tissues surrounding the injured bone.

In the case of a broken jaw, the bone should be set into position, with the teeth closed, and two bandages should be used—one passing from beneath and tied over the top of the head, the other from the point of the jaw-bone and tied behind the neck. With fractured ribs, collar-bones, etc., all that the non-professional assistant can do is to lay the patient on his back in as comfortable a position as possible, until assistance can be obtained. The same is true in cases of fractured skull or concussion of the brain—such injuries are usually indicated by bleeding at the nose or ears, or by blood settling in the whites of the eyes. In this latter case the patient should be laid in a dark cool place, with a cool wet cloth on his head, until surgical assistance may be obtained. *Under no circumstances should stimulants of any kind be administered.* In all injuries to the head and brain, alcoholic drinks, quinine, and drugs liable "to go to the head" are the worst possible things, if you desire the patient to recover.

TREATMENT FOR PARTIAL DROWNING

IN cases of apparent death, either from drowning or other suffocation, send immediately for medical assistance, blankets, and dry clothing, but proceed to treat the patient *instantly* on the spot, in the open air, with the face downward, whether on shore or afloat; exposing the face, neck, and chest to the wind, except in severe weather, and removing all tight clothing from the neck and chest, especially the braces.

The points to be aimed at are: first and *immediately*, the *restoration of breathing;* and, secondly, after breathing is restored, the *promotion of warmth and circulation.*

The efforts to *restore breathing* must be commenced immediately and energetically, and persevered in for one or two hours, or until a medical man has pronounced that life is extinct.

Efforts to promote *warmth and circulation*, beyond removing the wet clothes and drying the skin, must not be made until the first appearance of natural breathing. For if circulation of the blood be induced before breathing has recommenced, the restoration to life will be endangered.

MARSHALL HALL'S METHOD

TO CLEAR THE THROAT.—Place the patient on the floor or ground with the face downward, and one of the arms under the forehead, in which position all fluids will more readily escape by the mouth, and the tongue itself will fall forward, leaving the entrance into the windpipe free. Assist this operation by wiping and cleansing the mouth.

If satisfactory breathing commences, use the treatment described below to promote warmth.

If there be only a slight breathing, or no breathing, or if the breathing fail, then—

TO EXCITE BREATHING.—Turn the patient well and instantly on the side, supporting the head, and excite the nostrils with snuff, hartshorn, and smelling salts;

or tickle the throat with a feather, etc., if they are at hand. Rub the chest and face warm and dash cold water, or cold and hot water alternately, on them.

If there be no success, lose not a moment, but instantly—

To Imitate Breathing.—Replace the patient on the face, raising and supporting the chest well on a folded coat or other article of dress.

Turn the body very gently on the side and a little beyond and then briskly on the face, back again; repeating these measures cautiously, efficiently, and perseveringly about fifteen times in the minute, or once every four or five seconds, occasionally varying the side.

By placing the patient on the chest, the weight of the body forces the air out; when turned on the side, this pressure is removed, and air enters the chest.

On each occasion that the body is replaced on the face, make uniform but efficient pressure with brisk movement, on the back between and below the shoulder-blades or bones on each side, removing the pressure immediately before turning the body on the side.

During the whole of the operations let one person attend solely to the movements of the head, and of the arm placed under it.

The result is respiration or natural breathing; and, if not too late, life.

While the above operations are being proceeded with, dry the hands and feet; and as soon as dry clothing or blankets can be procured, strip the body, and cover or gradually reclothe it, but taking care not to interfere with the efforts to restore breathing.

SILVESTER'S METHOD

Instead of these proceedings, or should these efforts not prove successful in the course of from two to five minutes, proceed to imitate breathing by Dr. Silvester's method, as follows:

Patient's Position.—Place the patient on the back of a flat surface, inclined a little upward from the feet; raise and support the head and shoulders on a small firm cushion, or folded article of dress placed under the shoulder-blades.

Forcing Air into the Windpipe.—Cleanse the mouth and nostrils, draw forward the patient's tongue, and keep it projecting beyond the lips; an elastic band over the tongue and under the chin will answer this purpose, or a piece of string or tape may be tied round them, or by raising the lower jaw, the teeth may be made to retain the tongue in that position. Remove all tight clothing from about the neck and chest, especially the braces.

To Imitate the Movements of Breathing.—Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upward above the head, and *keep them stretched* upward for two seconds. (*By this means air is drawn into the lungs.*) Then turn down the patient's arms and press them gently and firmly for two seconds against the sides of the chest. (*By this means air is pressed out of the lungs.* Pressure on the breast-bone will aid this.)

Repeat these measures alternately, deliberately, and perseveringly, about fifteen times in a minute, until a spontaneous effort to respire is perceived; immediately upon which cease to imitate the movements of breathing, and proceed to *induce circulation and warmth.*

Should a warm bath be procurable, the body may be placed in it up to the neck, continuing to imitate the movements of breathing. Raise the body in twenty seconds in a sitting position, and dash cold water against the chest and face, and pass ammonia under the nose. The patient should not be kept in the warm bath longer than five or six minutes.

To Excite Inspiration.—During the employment of the above method excite the nostrils with snuff or smelling salts, or tickle the throat with a feather. Rub the chest and face briskly, and dash cold and hot water alternately on them.

The above directions are chiefly Dr. H. R. Silvester's method of restoring the apparently dead or drowned, and have been approved by the Royal Medical and Chirurgical Society.

AFTER RESTORED BREATHING

To Promote Warmth and Circulation.—Wrap the patient in dry blankets, commence rubbing the limbs upward, with firm grasping pressure and energy, using handkerchiefs, flannels, etc. (By this means the blood is propelled along the veins toward the heart.)

The friction must be continued under the blanket or over the dry clothing.

(1.) Promote the warmth of the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, etc., to the pit of the stomach, the armpits, between the thighs, and to the soles

of the feet. Warm clothing may generally be obtained from bystanders.

(2.) If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room.

(3.) On the restoration of life, when the power of swallowing has returned, a teaspoonful of warm water, small quantities of wine, warm brandy and water or coffee, should be administered. The patient should be kept in bed, and a disposition to sleep encouraged. During reaction, large mustard plasters to the chest below the shoulders will greatly relieve the distressed breathing.

CAUTIONS

(1.) Prevent unnecessary crowding of persons round the body; especially if in an apartment.

(2.) Avoid rough usage, and do not allow the body to remain on the back unless the tongue is secured.

(3.) Under no circumstances hold the body up by the feet.

(4.) On no account place the body in a warm bath, unless under medical direction, and even then it should only be employed as a momentary excitant.

The police in many of our large cities are instructed to place the patient face downward over a barrel, rolling it briskly to and fro. This motion helps to expel the water from the lungs. But the most important thing of all to remember is to send some bystander running for the nearest physician.

The above treatment should be continued for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance. Persons have been restored after persevering for many hours.

INDICATIONS OF DEATH

Breathing and the heart's action cease entirely; the eyelids are generally half-closed; the pupils dilated; the jaws clinched; the fingers semi-contracted; the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increase.

BOXING

THE SCIENCE and art of boxing is an accomplishment valuable to any man, both on account of furnishing him with a ready means of self-defence, and, also, for the sake of the valuable exercise of mind and body to be obtained by practicing it. Because certain professional boxers are also prize-fighters, it would be senseless to condemn the art.

In almost every branch of human effort the greatest stimulus to ambition lies in the possibility of contests with others, if it be only the friendly rivalry that belongs with games and plays of all descriptions. So, also, when two men, of nearly equal strength, endurance, and skill, put on the gloves for a friendly sparring match, they indulge in an exercise that is enjoyable, as well as profitable. There are many ways in which the one or the other may be overcome without doing him injury; while the constant exercise of skill and watchfulness, to prevent such advantages as result from well-directed blows on any portion of the anatomy, is a mental benefit of no mean order.

Apart from all these advantages, there are many occasions when a thorough knowledge of boxing is of the utmost use. In case of being attacked by a ruffian, it is desirable to know how to defend one's self, and to have the skill to land blows where they will soonest disable or subdue such an unfair antagonist.

THE PRINCIPLES OF SCIENTIFIC BOXING

IN entering upon the study of boxing, one must distinctly understand that he has begun work in an art having a serious purpose. He must understand that its real aim is not merely to obtain the exercise and beneficial "pummeling" that come from a friendly sparring match, but to teach him where and how to strike an opponent in order to overcome him. Having grasped these facts, he readily recognizes that he must study to become proficient in the several kinds of guard, in order to protect himself, while seeking to land a blow on his opponent's body.

ELEMENTS OF BOXING.—There are four elements in the art of boxing—*leads, feints, guards,* and *counters.* A *lead* is a blow struck in offence, with the design of reaching some vulnerable point on an adversary's person. A *feint* is any movement of the limbs, body, or eyes intended to deceive an adversary as to the *lead* about to be made, and cause him to guard the wrong point, leaving others unprotected, or to make a *lead,* giving chance for a good *counter.* A *guard* is a defence with the arm—particularly the forearm and elbow—against a blow from an adversary. A *counter* is a return blow, struck in answer to a *lead* that has been effectually fended off or avoided, or as part of the tactics adopted in order to avoid it.

DUCKS AND SIDE-STEPS.—In addition to these, it is desirable that the boxer be carefully prepared to *duck* or *side-step,* in order to avoid *leads* and *counters,* whenever convenient or advantageous, or whenever it is difficult or undesirable to merely guard with the arm. Straight leads for the face, as we shall see later, can often be advantageously avoided by merely drawing the head back out of reach, or by ducking to

the side. These motions are desirable in many cases, particularly as preparatory to cross-countering.

BEHAVIOR IN BOXING

Understanding these points, we may readily see that a skilful and successful boxer must combine a number of scientific qualities.

(1.) He must maintain a firm position in making *leads,* carefully watching and guarding, meantime, against such *counters* as are possible against points necessarily left unprotected.

(2.) He must know how to prevent himself from being deceived by the *feints* of his adversary by not taking guard *too rapidly;* thus leaving other points of his person exposed to ugly blows.

(3.) He must determine on the *lead* he wishes to make, and make it *as quickly as possible,* when the opportunity occurs.

(4.) When a certain lead has been made, he must be ready, whenever it is possible or desirable, to respond *quickly* and *strongly* with a *counter* at the most convenient point on his adversary's person.

(5.) He should not waste his strength, or needlessly expose his own person, by leading or countering at undecisive points —which is to say, points not recognized as "vulnerable."

(6.) He must be ready at all times to take advantage of an unguarded point in his adversary, and to end any feinting and foolery by a strong blow from the shoulder.

(7.) He must be able to consistently pursue a plan of fighting best adapted to his adversary in each particular case. If, for example, he is attacked by a man stronger or more skilful than himself, by one noted for particular "tricks," or, by a person whom he does not wish to harm—as, for example, a woman or an intoxicated man—his best policy is to carefully guard against all leads, saving his strength, either until a favorable opportunity occurs for decisive action, or until his opponent shows signs of tiring or has revealed weak points in his tactics.

This last rule is better calculated for guidance in serious fights than in mere sparring matches. In the former, the best all-around rule is, "Make the other man hit first." This is advantageous in every sense: scientifically, morally, and legally.

VULNERABLE POINTS

Since, as already stated, the primary aim of the art of boxing is to provide an effective means of self-defence, it follows that its proper theory and practice involve ending a fight as quickly as possible, while doing no more injury to an opponent than is positively necessary for that purpose. Hence, all *leads* and *counters* that are recognized and practiced by boxers are deliberately directed toward points where a blow is likely to result in temporary disablement. Such points are situated at either side of the head, from the hinge of the jaw to below the ears; on either side of the body at the level of the lower ribs, from the side to near the middle of the back; at the centre of the body, just below the breast-bone; at the full face, either on the point of the jaw or between the eyes. A well-directed blow at any of these points will result in temporary disablement, although not necessarily inflicting serious injury.

THE TECHNIQUE OF STRIKING

In striking at an adversary it is necessary to carefully observe the rule that the blow should be straight outward with the knuckles, and never downward, with a *chopping* movement, nor upward, except in upcuts. On landing a blow the arm should be as nearly straight as the distance between the combatants will permit. It should never be crooked at the elbow, except in aiming blows at the side of an opponent's head or body; and, in such cases, the forearm should be slightly turned, so as to bring the back of the fist inward, thereby lengthening the reach, and giving the knuckles of the second joint of the fingers as the point of contact. In the last-named variety of blows, the crook at the elbow also serves to give the arm greater resistance against an opponent's side-stroke in guarding; since it is easier to straighten out under his stroke than to run the risk of a broken arm.

CHOPPING BLOWS, while recommended by some of the older writers on sparring, are very dangerous, and should always be avoided. They are, to be sure, very well calculated to injure an opponent's countenance, if successfully landed, but, if he is at all skilful, he will take serious advantage of the "chopper's" unguarded "mark" —for so older authorities designate the point, on the centre of the body, at the junction of the ribs—and land a stunning blow. A chopping blow is also comparatively easy to avoid or guard off, and, because it shortens the reach, it is by no

means as convenient or effective as one struck straight out from the shoulder.

POSITION OF THE BOXER

The first and most important consideration in successful boxing is the position. There are two things to be considered: (*a*) the position of the arms; (*b*) the position of the feet.

In modern sparring the universally recognized rule is to hold the left arm in readiness for leading, and the right arm as a guard across the chest. For these reasons, the left arm should be advanced from the shoulder to the elbow, until the latter is between six and seven inches in advance of the body. The right arm should be held across and about three inches clear of the chest; the hand turned slightly downward and at about the level



Position of the Boxer.

of the left shoulder. The former is thus in position for leading at the first opportunity; the latter, for meeting and parrying an opponent's blows.

The weight of the body should be evenly divided between the two feet, which should be sufficiently far apart to afford a firm support, while allowing the body freedom to move, without altering the ground position. A firm support also prevents, as far as possible, a knockdown from a heavy blow, or a fall due to a too rapid shift. It is also necessary to be well balanced, in case your opponent ducks and avoids a straight forward lead, into which the whole weight of the body is thrown.

In taking position, the sparrers should stand with their left sides slightly directed toward one another. The left foot should always point directly at an opponent; being parallel to the left arm, and so advanced as to bring the heel as nearly as possible under the elbow joint of the left arm.

All muscles should be in as flexible condition as possible—neither drawn nor tense—so as to admit of easy quick movements in any direction, either in making or avoiding blows. In changing positions, the left foot should be advanced or moved backward first, allowing the right foot to follow, except in making side-steps; at all times carefully preserving the balance. In making side-steps, the balance is the first consideration. If the weight rests on the right foot, just previous to a right-side movement, the left foot should be moved toward it, taking the weight, before the right is moved. In making left side-steps, from a position in which the weight rests on the left foot, the opposite course is to be followed—the right foot being first moved to the left to take the weight, leaving the left free to shift the position of the body as desired. These rules are of the utmost importance in successful sparring.

RULES FOR LEADING

As already stated, the recognized rule of modern boxing is to lead with the left hand, reserving the right for guarding or for certain counters. This practice is so firmly established that a man who leads with his right is at a decided disadvantage, and constantly exposes his person by leaving his body unprotected. Some skilful boxers can lead with either hand, and numerous instructors teach both methods, so as to thoroughly equip them for meeting all emergencies and profiting by all advantages. It is not necessary, however, to discuss right-hand boxing, since the regular method, if thoroughly understood, is quite sufficient for ordinary purposes, and also requires all the study and attention that the beginner can afford to give.

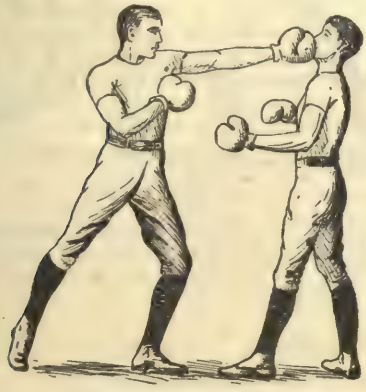
FEINTING

At the beginning of a sparring match or stand-up fight, it is desirable to feint, in order to discover an opponent's skill and methods; oftentimes, also, with the view of causing him to make some particular lead that may be readily parried, or that will give opportunity for the counter desired. Altogether the safest and readiest blow to attempt as a lead is the straight left for the face; since, although it may be readily parried by a skilful and watchful boxer, it leaves the body or face perfectly protected.

STRAIGHT LEFT FOR THE HEAD

This blow, which is called "Number One" by several of the older writers on boxing, is to be delivered straight out from the shoulder, carefully avoiding crooks of the elbow in attempting to up-cut, and, above all, any effort to make a chop downward. In making it, the boxer should move forward—carefully maintaining balance perfectly at all points—and lead out the instant he is within striking distance. The trouble is that, when matched with a clever opponent, he may be unprepared for side-steps that would land him on his face, if imperfectly balanced, or expose him to some foul blow that might result seriously. This is an eminent example of the prime importance of a firm and balanced position, and of the ability to move and check one's self quickly. Having delivered the blow, spring back into position, out of reach of a cross-counter.

Should this blow be parried, the leader is again exposed to the danger of losing his balance, and should be carefully prepared against this contingency. With the right hand slightly inclined inward, as shown in the position of the boxer, the *left hand lead for the head* may be readily parried by raising the arm and striking the

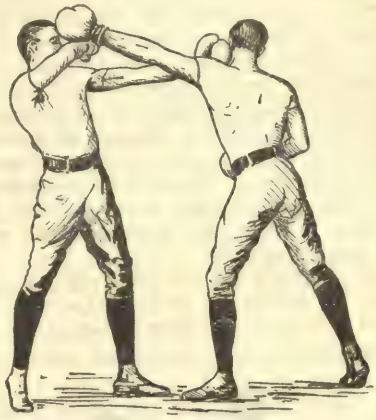


Left-hand Blow for the Face.

opponent's arm upward and outward with the right forearm, at the same time strongly bracing the body. Unless he is very careful, therefore, the leader is quite liable to be thrown off his balance.

LEFT COUNTER FOR THE HEAD

After parrying the *left lead for the head*, the boxer will find his opponent in a position open to a *left counter* for the head. In delivering this blow, both arms are sent out at once: the right, to parry the opponent's left lead, as already described; the left, straight forward for his face. It is possible to meet this left-hand counter, either by drawing back the head out of



Left-hand Counter for the Head with Guard.

reach, or by ducking to the right. If not avoided, it is most severe; having double strength, owing to the leader's own weight in advancing being thrown in with the strength of his opponent in countering.

DUCKING FROM A LEFT LEAD

A far better and more scientific way of meeting and countering a lead for the head is to practice ducking to the left, which requires only a free movement from the hips, and is not likely to endanger the balance. With any but the quickest and most skilful opponent, this may be successfully accomplished; provided the eye be carefully trained, by long practice, to time the lead. It is often difficult, however, even dangerous, against some expert boxers, who seem literally prepared for any possible emergency. Perhaps, therefore, it is well to avoid ducking away from a lead, until the match is sufficiently far advanced to allow one to judge of his opponent's skill and quickness.

RIGHT COUNTER FOR THE HEAD

One of the greatest advantages of a duck to the left, to avoid a *left-hand lead* for the head, is that it gives opportunity for a *right counter*. On this account, clever boxers often feint so as to draw an opponent's left lead. The procedure is then simple: instead of throwing the right arm upward, to parry the lead, it is shot straight

out from the shoulder, so as to pass, outside of and somewhat above the leader's left arm, straight for his jaw. At the instant that this movement is made the head is ducked to the left, allowing the opponent's arm to pass over the shoulder, or, at worst, to only graze the side of the head, without inflicting any serious injury. It is important in delivering this blow that the knuckles be turned outward, and that the arm be somewhat crooked, so as to balance the leader's probable inclination of his head in lunging, or his attempt to duck in avoiding the counter. This blow, if properly delivered, is even more punishing than the left-hand counter, but is much more difficult and dangerous.

The skilful boxer must be fully prepared above all things to successfully evade or guard against cross-counters, which, on account of their great punishing power, are



Right Cross-Counter for the Head.

favorite movements both in a sparring match and in stand-up fights. It may be possible, even after leading directly for an opponent's head, to check the movement of the left arm, and use it as a guard to throw off his right. If this is impossible, as frequently occurs in the quick movement of a sparring match, it still remains to the leader to duck his head still further to the right, or to spring back, thereby causing the blow to pass over his left shoulder, or grazing him but slightly. When it is possible to withdraw the lead and to guard the left forearm or elbow, it is desirable to lift the knuckles by turning the hand upward at the wrist, thus giving a stronger guard and good resisting power to a heavy blow.

LEADING FOR THE BODY

While it is comparatively easy to make a straight lead for the head, as already described, a lead for the body requires considerably more care and skill. This is true because the boxer always has his body well guarded, and, to land an effective blow on his chest or ribs, it is necessary to induce him to raise his guard. In attempting to lead for the face, also, one exposes himself to any one of the counters already described, all of them being most punishing. If, therefore, one desires to land an effective blow or to end a fight with an opponent stronger, more skilful, or taller than himself, a lead for the body will be most effective in accomplishing the desired result.

LEFT LEAD FOR THE BODY

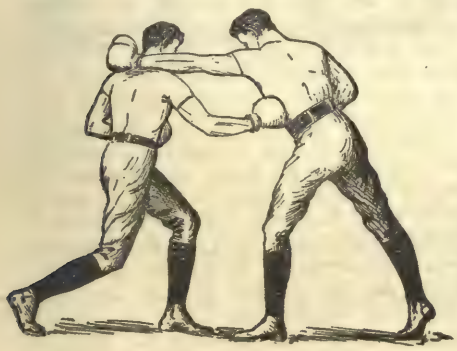
Effective body blows may be made either with the right or left hand; the latter being the most convenient in a lead. In leading with the left hand for the body, it is necessary to induce an opponent to raise his guard, which may be done by feinting at him with the left hand, as though intending to lead for his face. After several feints at this lead, he will, of course, raise his right arm, in readiness to protect his face, thus exposing his chest and body to a straight blow with the left. In making this lead, it is necessary to spring forward, throwing the weight upon the left foot, until within the proper distance to make a straight outward stroke. It is desirable to come no nearer to your opponent than is positively necessary to strike him, since the right arm is scarcely able to protect your own person by guarding, and your head and face are liable to be exposed to several ugly counters. Therefore, the head should be held well to the right, and the chin depressed as much as possible. This blow being successfully delivered, recover position quickly.

PARRYING A LEFT BODY LEAD

Since a blow in the body is liable to have an immediate disabling effect, it is seldom that a left-hand lead can be successfully landed on a skilful opponent. Although he may be deceived by continued feints at the head, he will be prepared to ward off the blow in two or three ways. (1.) He may either lower his right arm the instant he perceives your intention for leading for his body and, coming down sharply on your wrist, throw your arm downward and outward, thus effectually stopping the blow. (2.) In case he can not lower his guard sufficiently soon, he can deliver an outward and downward blow with his left

that may throw you off your balance and expose you to his blows on your head or neck. (3.) While both these guards are most effective, when one is thoroughly sure of his opponent's intention to lead for his body, neither of them would be of service in the event that he was simply feinting, with the intention of confusing you and finally leading for the face. The safest plan, therefore, until thoroughly acquainted with the skill and methods of your opponent, is to guard against a left-hand lead for the body by lowering both arms quickly and crossing the hands over the pit of the stomach. This motion will not only serve to guard off the blow, but will also enable you to quickly raise your right arm, to protect your face, in case your opponent is merely feinting, or follows up this lead quickly with another for your face.

Similar tactics must be adopted in making a right-hand lead for the body, which,



Right-hand Body Blow.

on account of the advantages presented, may be even more effective than a lead with the left. In making this blow, it is necessary, either to feint, so as to induce your opponent to make a left-hand lead for your head, or to wait until he attempts that lead of his own accord. Your opportunity occurs the moment he raises his left arm, thus exposing that side of his body to a well-directed blow. In making this lead, step quickly to the left, strike out with the right arm for the centre of his body or the short ribs, at the same time carefully ducking your head to the left to avoid his lead. Having struck this blow, you are in position to follow up with the left for the same spot; thus quickly disabling your opponent, and enabling you to subdue him by changing the point of contact to the head and hitting with both hands alternately. Of course, such a procedure is conceived primarily with the view of overcoming a dangerous and persistent adversary in a serious fight.

Owing to the position of the contending parties, it is particularly difficult to guard against a right-hand body blow. The principal reason for this is that the left arm, being in action in leading for the opponent's head, the left side of the body can not be protected. If, however, you can check the movement of the arm sufficiently soon to lower it rapidly, you can form a very effective guard by folding the hands together over the left side. It is always possible, however, to spring quickly out of reach, and, although missing the blow at your opponent you had already begun, to save yourself from severe punishment.

SWINGING BLOWS

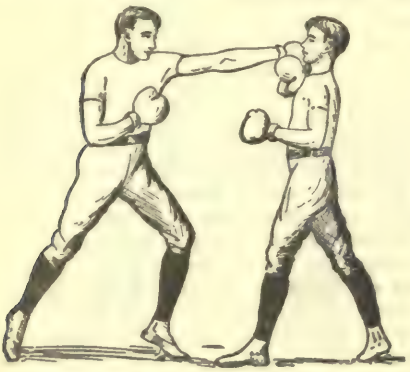
In most of the leads and blows already described the movement of the arm is straight outward from the shoulder. There are, however, several other varieties of stroke practiced by modern boxers, which have the effect of inflicting considerable punishment, and also of effectually disconcerting an opponent. Among these may be mentioned the swinging blows for the head and the up-cuts. All of these blows are very difficult and dangerous, not only because of the necessity of swinging the arm round the opponent's guard, but also because the whole of one side of your person is left unprotected, and the arm attempting to swing is liable to be injured by your opponent's parry.

For a successful swinging blow, with either the right or left hand, it is necessary to deceive your opponent by clever feinting. This will be comparatively simple, if you have confined your tactics to straight strokes throughout the entire match. In making a left-hand swing for the side of your opponent's head or for the point of his jaw, it is necessary to spring quickly forward with the left foot, preferably outside your opponent's left, and in so doing, to swing your left arm, slightly bent in a half-circle, for the side of his face. The point of contact should be the first knuckle of the fist. In making this blow balance must be preserved by pivoting the body on the ball of each foot. The head should be ducked well to the right to avoid any counter blow that may be attempted.

If the boxer is sufficiently watchful and alert, it is possible for him to effectually avoid or parry this left-hand swing. The

way to do this is either to spring back quickly out of reach, thus probably causing your opponent to lose his balance and swing half-way round, exposing his head or body to an effective right swing or to parry. In parrying, it will be necessary to throw the right arm upward and outward, bending it somewhat, so as to catch the opponent's arm on the point of the elbow, which, under some circumstances, might effectually disable him.

A swinging blow for the side of the head may be struck with the right hand, in much the same fashion as has already been described for the left swing. After successfully feinting at your opponent, you may deliver the blow, by springing forward with your left foot inside of his, and from this position swinging the right arm in a half-circle for his head, throwing the entire weight of the body into the blow. The



Landing a Swinging Left-hand Blow for the Head.

point of contact should be the first knuckle or the ridge formed by the second joint of the fingers. Since this blow is a difficult and dangerous one to deliver, it should be your constant effort to learn to land it with as little danger to yourself as possible. This can best be done by allowing the toe of the right foot to rest on the floor, thus adding to your reach, and furnishing a pivot upon which you may swing the whole body into the blow, and, at the same time, preserve your balance.

In spite of this risk, due to leaving your body unprotected against your opponent's right-hand counter, and of injuring your arm, if he catches it on his guard, this blow is the most effective one known to the art of boxing. It may be guarded in the same manner as has already been described, in connection with the left swing for the head. In both cases, the favorite practice is to present the point of the elbow to catch your opponent's swing.

UP-CUT BLOWS

It is necessary, for the sake of clearness, to again emphasize the fact that strokes with the elbow crooked are to be delivered only as occasion presents. The swinging blows for the head, as already described, are properly counters to straight leads, and are accompanied by ducks to the right or to the left, as the case may be, in avoiding such leads. The same rules apply to making up-cuts for the face with the left or right.

To state the matter briefly, we may say that the opoprtunity for an up-cut is when your opponent miscalculates his distance in making a lead or counter for the body, and, in order to reach your person, plunges his head and body forward. This is the very movement that an expert boxer will avoid making; and, for this reason, one seldom has opportunity to make a good up-cut.

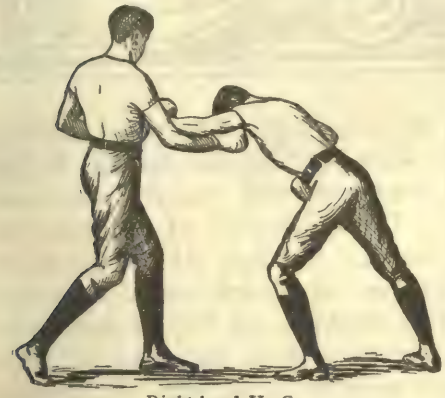
The left-hand up-cut may be delivered when your opponent makes a left lunge for your body, at the same time ducking forward to the right. In hitting this blow, it is necessary to step forward to meet his rush, and, while so doing, to drop the left forearm somewhat below the level of guard, and to draw back the upper arm from the shoulder sufficiently to give it a forcible forward movement. In making the blow, let the fist be inclined upward from the wrist, and, holding the arm rigid at all joints, swing out and up from the shoulder joint as a pivot. The point of contact should be the ridge formed by the second joints of the fingers, and the aim should be for the face.

If properly timed and landed, this blow will effectually check your opponent's lunge for your body, but it is a good practice to guard with the right arm, if possible, without turning the attention from the blow.

As may be readily understood, this blow is exceedingly difficult to parry. If you have made a bad lunge, and see that your opponent is about to up-cut, you may throw your right arm forward and downward, so as to receive the blow on the forearm and, if possible, strike it aside. It would generally be impossible to check the lunge you have already made, or to duck sufficiently to avoid your opponent's movement.

The right-hand up-cut is even more punishing than that delivered with the left, but is somewhat more dangerous, since it involves withdrawing the right arm from

the position of guard. However, if properly timed and delivered, it may serve to effectually check the lunge made at your body. Its delivery differs from that of the left up-cut; since it is not a mere movement of the crooked arm from the shoulder, but, *necessarily,* from the very nature of its conditions, involves the shoulder,



Right-hand Up-Cut.

body, and hips. It is, in fact, delivered with less motion of the arm than of the connected parts, and is most effective when the shoulder and body are drawn back at the hips, and the arm moves no more than is required to fill the distance between your opponent's face and the point at which the hand stops at the completion of the full swing of the body. In other words, the right arm should move only as if continuing the momentum of the body swing.

While the right up-cut is an ugly blow, if received full in the face, it is somewhat easier to parry than that delivered with the left. Since it can be given successfully only as a counter to a left lead for the body, it may be effectually avoided by swinging the left shoulder well forward, so as to obtain a longer reach for the body, and thus opposing your left arm as an effectual check to your opponent's right.

GRAPPLES AND CHANCERIES

As a general rule, grapples and chanceries are discountenanced in modern boxing. This is a good thing in several ways; since more attention is expended in acquiring expertness in the delivery and parrying of blows with the arms and fists; also, because, with skilful boxers, it is now recognized that to get the head in chancery is a doubtful advantage. This is true, since a thoroughly alert man can painfully injure, if not quite disable, his opponent, even when his head is in this undesirable position. In a serious fight, for example, he may nearly always reach his nearest arm around his opponent's back, and, grabbing him beneath the chin, compel him to loosen his hold. In fact, the science of self-defence has so greatly progressed at the present time that fighters avoid any kind of a grapple, except such as pinions an opponent's arms.

WRESTLING

WRESTLING is, undoubtedly, the most ancient form of athletic sport. Wall decorations in some of the temples of Egypt show how early it was in vogue in that country and how nearly it was then what it is to-day. The same kind of testimony is afforded by certain sculptures from Nineveh. Plutarch calls it the most cunning and artistic of games, and Homer has immortalized a match between Ajax and Ulysses. Sir Thomas Parkyns, an Englishman who was represented on his tombstone in wrestling dress and posture, published a book on the sport in 1741, and pointed to the story in Genesis of Jacob wrestling with the angel, to prove its antiquity. Wrestling was introduced into Greece from Egypt, about 708 B.C., and at once became a feature of the Olympic, Isthmian, and other games. It was the custom to seize by the neck, to throttle, to butt with the head, and to use other violent measures; also to roll on the ground. Thus, the contestants were wont to oil or grease their bodies to make their muscles supple, and to sand their hands in order to get a firm grasp. Rome, copying both the recumbent and upright styles from Greece, made the sport more intricate. The earliest recorded wrestling in Japan bears date of 23 B.C. Germany has been acquainted with the sport from a remote period, and in Great Britain its popularity runs far back before the Middle Ages. One of the most noted Puritan divines of New England, John Wise, of Ipswich, Mass., was a champion wrestler.

ELEMENTS OF WRESTLING

THE HOLD

THE wrestlers face, chest to chest, with the shoulders squared. Each places his chin on his opponent's right shoulder and grasps him round the body, placing his left arm above his antagonist's right, the hands joined, the fingers interlocked, so that the back of the right hand presses on the small of the antagonist's back. In placing the right arm, the further under your antagonist's you get it, the better for your hold; at the same time, keep your left arm well down to prevent him from getting his right shoulder too far through. The legs must be placed astride, the left foot being about two feet in advance of the other, the weight of the body being thrown on the right leg. It is a mistake to lean to the left, as some do, in taking hold, as one is thus easily thrown off his balance. The hold may be improved by shrinking the right breast under that of the antagonist, tightening the arms around his loins, or pinning his right arm by press-

ing upon it with your left. The hold secured, the play begins, kicking and the catching hold of legs, thighs, or arms being forbidden.

THE FALL

If one competitor lets go his hold before the other, though not on the ground, the decision is given against him. If either



The Hold.

touches the ground with one knee only or any other part of his body, though still keeping his hold, he is deemed the loser. If both fall on the ground, he who is first down or falls under the other is the loser. But if the competitors fall side by side, or otherwise, making a "dog-fall," as it is termed, so that the umpire can not decide which touched the ground first, they are obliged to wrestle over again.

THE BACK HEEL

This throw is both offensive and defensive, and is the best one for a beginner to master, for the excellent reasons that it is safe, easy, and the one most used. It consists in getting a leg behind the opponent's heel on the outside. It is safer to back-heel your opponent's right leg with your left than his left leg with your right, as he can not employ the hank so readily to foil you. Experts sometimes, though rarely, back-heel with both legs.

The back-heel may be foiled by slackening the hold and leaning forward, or by turning round for the cross-buttock; or by keeping the back-heel in and employing the hank. The hip, also, may be used with good effect.

THE HANK

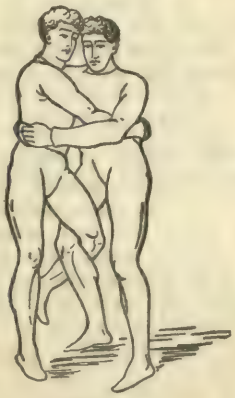
This is an unscientific chip and, moreover, dangerous. The wrestler turns his right or left side simply to his antagonist, clicks his leg on the inside below the calf, and pulls his man backward, falling on him, as a rule. The main thing in resisting is to avoid being pulled backward, and the next, to lean forward, taking a better hold and pitching your opponent forward.

THE OUTSIDE CLICK

This is a back-heel and is invaluable to a light-weight wrestler, but its value depends on the quickness with which it is employed. It is a defensive measure, which, if used in time, will save a man from being lifted clean off his legs, and frequently will bring down his opponent. The foe should be clicked as near the ground as possible.

THE INSIDE CLICK

This is a chip not easily mastered, but is an important one, for, if carried out dexterously, it enables you to have your opponent almost at your mercy. The method is that of the hank, with this difference, that you face your antagonist squarely. Holding him tight and pulling



The Hank.

him forward, you click him with the right or left leg, landing him on his back and frequently on the back of his head.

THE CROSS-BUTTOCK

This throw requires great rapidity of action, and is of much value when a wrestler has permitted his antagonist to get behind him. To perform it, you take a loose hold, turn your left side, and, getting your hip under your foe and tightening your hold round his neck or shoulders, cross

both his legs with your left and lift him from the ground. Unless the attack is seconded by the arms and upper part of the body, disaster will result. If your hold as you turn is very slack, you may be brought in front of your antagonist. If that is the case, keep the hands fast,



The Cross-buttock.

use the buttock, and twist your man forward with all your might. To foil this chip, if the aggressor does it in a bungling way, lift him up and throw him over your right knee on to his back, or, getting behind him, put one leg or foot across both of his. The right leg may be used in the cross-buttock, but the left is preferable.

THE BUTTOCK

This chip, which is not much in use nowadays, requires greater strength and alertness than the cross-buttock. Slackening your hold, you turn quickly, getting your hip further under than in the cross-buttock, and, without tripping your antagonist, throw him over your head. If the buttocker does not succeed in throwing his adversary, the latter gets a firmer hold and throws him.

THE HIP

For this many wrestlers use the left leg, but there is this disadvantage: that you are not able to lift your adversary so high, your left arm being above his right, and in case you do not succeed in throwing him you are liable to get into a slack hold which will put you in his power. Lift your man, carrying him to the left, at the same time twisting his left leg with your right so as to swing both his feet off the ground, and you can then easily lay him on his back. In using the left leg, if you fail to "grass" your man, bring the buttock or the inside click into play. As a rule, a short man should never try to hip a man taller than himself. To foil the hip either apply the click very low down, or close the knees and turn sidewise.

THE SWINGING HIP

This chip, which is difficult to stop, consists is swinging your antagonist after lifting him and before using the hip.

THE OUTSIDE STROKE

The safest way to use this chip is to half lift your man, twisting him round to the left, and to strike along the outside of his right leg and foot with your left, when, aided by your arms, he is quickly placed on his back. In case of failure with the left leg, you can still keep your hold, but in failure with the right, your foe secures a rasping hold.

THE HITCH OVER

Turning your left side to the adversary, put your left leg around his right on the inside, holding it up as high as you can, and while he is standing on his left leg,



The Hip.

withdraw your left leg from his right and cross his right as in the cross-buttock. This will bring him down quickly.

THE BREAST STROKE

In this the legs have no part, the arms and chest doing the execution. The fall is accomplished by grasping the antagonist firmly, twisting him quickly to one side and as quickly to the other.

CORNISH AND DEVONSHIRE STYLE

The men compete in loose, strong linen jackets, each getting hold as best he can, and seizing above the waist, or of any portion of the jacket, it being forbidden to take hold of drawers, handkerchief, or belt. Ground wrestling is forbidden. The best holds are the forehand-play, in which you are almost in front of your opponent, and the after-play, in which you are behind him. The manœuvres include the double-lock, employed to prevent one's adversary from lifting him off his feet, and consisting in twisting the right heel round the other's left on the inside, while throwing the left leg over his right, making a back-heel of it, and at the same time pressing him backward; the heave, in which, on facing your opponent, you place your right arm round his right shoulder, and reach over to his left loin, getting him under your right arm, then slipping the left hand under him so as to grasp his left elbow; the fore-hip and back-lock, which are the same, respectively, as the Cumberland and Westmoreland buttock and hank. Two shoulders and a hip on the ground, or two hips and a shoulder constitute a fall, and a man must be thrown flat on his back before any other portion of his body touches the earth before a decision can be given against him.

LANCASHIRE STYLE

The wrestlers compete in their stocking feet; it is allowable to catch hold of any part of the body, and to trip, but not to throttle or to maim. The principal feature is struggling on the ground, and two shoulders down constitutes a fall.

CATCH-AS-CATCH-CAN OR CATCH HOLD, FIRST DOWN TO LOSE, STYLE

This is of recent origin, and, being the most simple and the fairest for all parties, deserves great popularity. All modes of attack or defence are permitted, provided the contestants do not hold by the hair, legs, or clothes, or make use of painful or dangerous grasps. There is little restriction as to how the hold shall be taken, but contestants generally aim either for a head hold or a grip round the waist. In the former, one arm of each man usually rests on the nape of the other's neck, while the other grasps his wrist. A wrestler is thrown if he falls on his back, both shoulders touching the ground. At the commencement, the men face, heads up, legs straddled apart, the knees very much bent, the body bowed forward from the hip joints, the arms hanging down in front of the knees.

The cross-buttock can be used with good effect in this encounter, by seizing your man's left arm or wrist with your right hand, and, while placing your left arm round his body, crossing his left leg vigorously with your left and vigorously jerking him down. When a head hold has been taken and the cross-buttock applied, your opponent usually turns a complete somersault.

THE BACK HEEL

To use this chip in catch-hold wrestling, catch your adversary round the head, jerk him forward, and, as he steps in with one



The Back-heel.

leg to steady himself, place your foot behind his on the outside and bend him over backward. To foil this chip, clasp your man round the waist with the under-hold, if possible, and apply the hip, or turn suddenly round sidewise, with your arms round his neck, and bring the hank into play.

STANDING CHANCERY AND BAR HOLD

The aggressor catches hold of his opponent's head with the right hand and pulls it down under his left arm, securing the standing chancery hold; then slips his right hand and arm under his opponent's left arm and across his back, securing the bar hold. By leaning heavily upon his opponent's neck with the chancery hold and twisting vigorously round with the bar

hold, the aggressor compels his opponent to sink to his side, from which position he may press his shoulders to the ground.

HEAD IN CHANCERY

The aggressor grasps the wrist of the arm which has the chancery hold and draws it in to his body, so that the pressure upon his opponent's head comes across the jaw and cheek-bones. The hold must not be secured round the neck.

THE FLYING MARE

This throw requires great rapidity of execution. In the beginning it resembles the cross-buttuck. Swing yourself around, facing in the same direction as your opponent, bringing your shoulder under his armpit. Bend forward, holding his arm tightly down in front of his body, thereby



The Half-Nelson

lifting him off his feet. A forward, followed by a sidewise, movement—your opponent's arm being still tightly held—will enable you to throw him upon his shoulders, or, by freeing your hold upon his arm, you may throw him straight forward over the shoulder. To foil this move, place your hand upon your adversary's hip, as he turns, blocking the move, as in the cross-buttock, by coming under his armpit.

THE HALF-NELSON

Face your adversary, grasp him by the right wrist with your left hand, then thrust your right hand quickly under his arm, while you firmly seize him by the neck and press his head forward; your next move is to quit his right hand, and by clasping him round the waist to give him the Cornish heave, and lay him on his back.

THE OUTSIDE STROKE

Induce your man to stand with one leg, say the left, well advanced. Place your right hand on his left shoulder; at the same time strike as in the northern style, close to the ground, and at the same time seize him under his right armpit and twist him on to his back. If he changes legs, try to get a head hold, and strike his right leg in the same manner with your left. To foil the outside stroke, stand square with both legs and give your foe no chance to throw you off your guard.

THE GRAPEVINE LOCK

The aggressor, in a standing position, secures a waist hold from the side upon his adversary, so that both men face in the same direction. Locking his left leg round his opponent's right, from the inside, he reaches over in front of the latter and seizes his left arm above the elbow, bends forward, lifts the grapevine-locked leg of his opponent upward and to the rear, twists him underneath, and falls forward, keeping his weight closely applied to the other's chest.

THE DOUBLE NELSON

This is a Lancashire, Cornwall, and Devon chip, and is practically, and with reason, debarred in the United States. It is both difficult and dangerous, and consists in getting behind your opponent, placing both arms under his, clasping your hands round the back of his head, and then bending it forward. It can be made effective only when the adversary is a slender man.

NEW SCOTCH STYLE

In this the hold is taken as in Cumberland and Westmoreland, and if one falls flat on his back, the contest is over, but if a fair back fall with both shoulders down does not result, the play is continued in the French style, as a struggle on the ground until one man or the other is exhausted. In beginning, the wrestlers take hold from the head, and not lower than this when on the ground. Tripping is not allowed.

IRISH STYLE

In this the first down is the loser. The wrestlers take hold of the elbow with one hand and of the collar with the other; neither party being allowed to let go till there has been a fall.

FRENCH, OR GRÆCO-ROMAN, WRESTLING

The following are the rules in French wrestling:

1. The wrestlers are only allowed to take hold from the head, and not lower than the waist.

2. Taking hold of the legs and tripping are strictly forbidden.

3. The wrestling is with open hands, and the wrestlers are not allowed to strike, scratch, or to clasp hands. Clasping hands means that the wrestlers shall not clasp one of their hands within the other, nor interlace their fingers; but they are allowed to grasp their own wrists to tighten their hold round their opponent's body or otherwise.

4. The wrestlers must have their hair cut short, also their finger-nails, and they must wrestle either barefooted or with socks.

5. If one of the wrestlers fall on his knee, shoulder, or side, they have to start again.

6. If the wrestlers roll over each other, the one whose shoulders shall touch the carpet first is deemed conquered.

7. To be conquered, it is necessary that both shoulders of the fallen shall touch the ground at the same time, so as to be fairly seen by the judges and the public.

GERMAN WRESTLING

In this, strength and stamina are the chief factors, and the main object is a full hold. Both arms are placed around the opponent's body below the armpits, so as to lift him, if possible, off the ground and throw him on his back. It is permissible to shift the hands about unlocked; but the wrestlers are forbidden to catch hold of the legs, or touch below the waist. Tripping and entrapping by movements of the feet or legs are forbidden also. The back may not be presented; hence the buttock and cross-buttock can not be employed. The fall is when both shoulders touch the ground.

FENCING

ROLAND, in his "Theory and Practice of Fencing," says: "Perhaps there is no exercise whatever more calculated for developing and cultivating bodily strength and activity than this. Riding, walking, sparring, wrestling, running, and pitching the bar are all of them highly beneficial; but beyond all question there is no single exercise which combines so many advantages as fencing. By it the muscles of every part of the body are brought into play; it expands the chest, and occasions an equal distribution of the blood and other circulating fluids through the whole system. More than one case has fallen under the author's own observation, in which affections of the lungs and a tendency to consumption have been entirely removed by occasional practice with the foil." He might have added: There is no exercise which imparts more grace to the movements or gives greater keenness to the eye. The method of the French school, which is that used in the United States and Great Britain, is described in this chapter.

LINES.—In fencing language, the front of the body is divided by an imaginary line, horizontal and just below the breast, separating the upper from the lower portion; the upper part is subdivided by a perpendicular line, the right of which is termed the outside, the left, the inside. The lower lines are the lower, to the left of the fencer's blade, and the exterior, to the right. Engagements in the lower lines are more common in Italian than in French fencing.

GENERAL RULES FOR FENCING

THE FOIL, OR SMALL SWORD, briefly described, consists of two parts: the blade and the hilt, which includes the guard of metal reinforced by thick leather, and the grip. The blade is tipped with a button, and it is important before exercising to see that the button is secure. The part of the blade near the point is the *foible*, that near the handle, the *forte*. The thumb should extend along the convex side of the handle at least half an inch from the guard. The forefinger is partially extended on the under side, the middle portion opposite the thumb. The remaining fingers embrace lightly the side of the handle.

It is not necessary to change the hold for any of the movements of correct fencing. The position of the hand on the wrist—consequently also of the foil—varies between *supination*, in which the thumb is turned upward and the back of the hand toward, and *pronation*, in which the back of the hand is upward and the thumb to the left. These variations, produced by movement at the wrist, change the dip of the point from upward to downward.

POSITIONS.—These are three in number: that taken before the fencer places himself on guard; the position on guard; the lunge or extension. In the first named, the heels must touch; the right foot points toward

the adversary and the left foot at right angles to it. The legs must be straight; the body turned toward the right and presenting three-quarters of the face to the opponent; the hand holding the foil at about the height of the head, the arm straight and inclined to the right; the hand in supination (*i.e.* with the finger-nails turned downward); the left arm falling naturally by the side, but clear of it, the hand turned outward.

THE GUARD is the position from which all movements, offensive or defensive, are made. The fencer places his right foot twice its length in front of the left, bending the knees so as to distribute the weight of the body equally between the two legs, the right, from ankle to knee, being perpendicular. At the same time, the foil is raised to the height of the waist and turned near the left side, bringing the point to the front; the right arm is extended till it is half bent, the elbow about six inches in front of the side and turned in toward the body, the hand at the height of and opposite the right nipple, the nails in pronation (turned up), the thumb horizontal, the back to the right. The point of the blade should be at the height and in front of the eyes. (It should have been stated before that the fencer turns three-quarters face toward his opponent.) The left hand is extended to the rear and a few inches higher than the head; the elbow is slightly bent; the hand open, palm to the front. The arm, from the shoulder to the end of the fingers, forms a curve. The reverse of this position is true for left-handed men. The guard just described is termed the *middle guard,* because the weapon occupies a middle position in reference to those it assumes in the defence. The guard must be raised according to the height of that of the opponent, tall men forming it with the hand a little below the breast. When the hand has been carried so nearly in front of the right shoulder that the adversary's point, if extended, on that side would not touch, the fencer is *covered* and the guard of tierce is formed; if the hand is sufficiently in front of the left breast to divert the point on that side, the guard of quarte is formed.

THE LUNGE OR EXTENSION.—Stretch the right arm straight, keeping it at the height of the shoulder, without bending the body; pointing it direct to the spot aimed at; put the hand in supination; advance the right foot about a sole and a half (if the length of the fencer's leg will allow); lift the toes a little, the heel brushing the floor; at the same moment that the heel is advanced tighten the loins, press in the left hip, straighten the left leg and thigh; drop the left hand to the left thigh without touching it, the palm turned outward. It is important that the whole of the left foot should be kept firmly fixed on the ground. The knee of the right leg should, when the lunge is completed, be just over the instep.

OPPOSITION is the act of covering the body with the blade when delivering a thrust, on the side where the foils happen to cross, and to avoid receiving a blow in return when in the act of recovering the position of guard. If the foils are crossed in quarte, and one fencer holds his blade

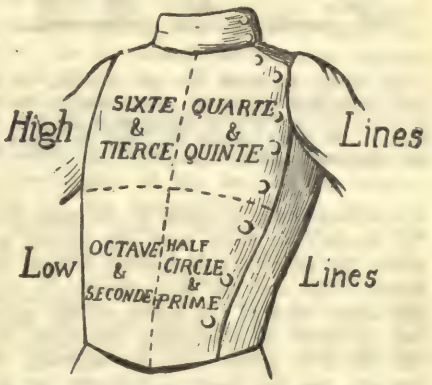


Diagram of a fencer's waist quartered to show the points of the body against which thrusts are aimed, and which must be guarded by the parries named accordingly, as explained in the following cuts and description.

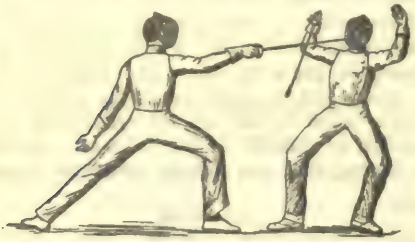
so far to the left that, if the other thrusts to the left, his point must go past the body, the former takes opposition in quarte.

THE ENGAGEMENT is when the adversaries have come to the guard and join blades. It may take place in each of the four lines, and is either called engagement simply, or is named after the parry formed when the blades meet. If the right of the blades is in contact, the engagement is in *tierce;* if the left, it is in *quarte.* When the hand is turned so as to bring the back up and obliquely to the left, and the points are lowered and meet in contact on the right and at the height of the groin, the engagement is in *seconde.*

CHANGING THE ENGAGEMENT.—This has been concisely described as making a very small quick movement of the point, pass-

ing it under and as near as possible to the blade of the antagonist to the opposite side, executing the movement abruptly and with the fingers only, without lowering the hand. The fencer should cover the moment the opposing blade is felt.

To Recover the Guard, throw the left arm nimbly up to its place; draw in the right arm, and rebend the left knee. These



Prime Parry

The thrust *in prime* for the left side of the body is parried by the act of striking up the opponent's foil by lowering the point of the foil, the back of the hand toward the face, as shown in the right-hand figure.

movements must be made at the same time *the advance* is made from the guard, and when the adversary is beyond hitting distance. The step, in the advance, is usually about that of the width of the guard, and is made by advancing the right foot the distance given; on its reaching the ground, the left foot is brought up and takes its place. It is important to have one side of the body secured by the position, particularly that side to which the antagonist's blade is opposed; so that if he commence an attack during this movement, he must quit the blade in order to direct his thrust or feint at any opening the position of his opponent gives him.

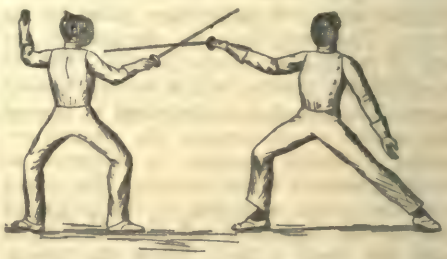
The Retreat is the reverse of the advance. The left foot takes the lead, stepping to the rear about as much as the right had stepped to the front; the right occupying its place on its taking up the new position.

Attacks.—"There are three main points of attack," to use the words of Kelton, an authority often quoted: "On the 'right,' which is a blow at the face and right side, on the right side of the weapon; on the 'left,' which is an attack on the face and left side, on the left of the weapon; and 'below,' which is a blow under the second arm."

The modes of attack are three in number: (1) a quick thrust given merely by the wrist, the arm being elevated and advanced at the same time, with the point directed at the opponent's breast; (2) what is technically called an extension; (3) the lunge and recovery.

Thrusts are directed solely at the body, a hit upon a limb not being counted. The simplest form of attack is the *straight thrust*, used when the antagonist, from his position on guard, leaves sufficient opening to enable him to be touched upon that side of the body on which blades are joined. In this attack, raise the wrist suddenly, bringing the forte of your sword to the foible of your adversary's; then lunge at once on the same line to his breast, keeping the while a correct opposition. Movement of the hand and arm must precede that of the body or foot. The description of the lunge is practically that of the straight thrust; it is a lunge in a straight line, care being taken to feel the adversary's blade firmly, bringing the forte of one's weapon to the foible of the adversary, but not pressing or leaning on the blade while making the thrust.

The Disengagement is another form of attack, and is made by dropping the point of the foil beneath the adversary's blade, and raising it on the opposite side; at the same time rising with the arm fully extended. It is used when an antagonist



Quarte Parry

The thrust *in quarte* for the left side of the body, on the high lines, is parried by *striking down* to the left the opponent's foil by assuming the attitude shown in the left-hand figure.

leaves sufficient opening to enable him to be touched upon that side of the body on which blades are joined. On the completion of the extension, the lunge is made and the thrust delivered. In French fencing, disengagement is usually from one upper line to the other.

The Beat and Thrust is a form of attack used when your adversary's blade is

firmly joined to yours and you wish to deliver a straight thrust, but are in danger of falling upon his point. In this case, you give a slight beat on his blade, follow it swiftly with an extension of the arm, and this immediately with the lunge.

THE ONE, TWO is a double disengagement; the first being a feint to induce the opponent to parry to cover the part threatened, the covering of one part of the body naturally exposing the opposite. The second disengagement takes advantage of this exposure. The arm is extended half-way on the first, and then wholly on the second, and is immediately followed by the lunge.

FEINTS, which are so numerous that only a few can be given here, are simply false attacks, or thrusts, to deceive the antagonist, and are followed by a disengagement or a direct blow. One, two, just described, is a feint. In all feints the hand should be in supination. To execute a feint, keep body and legs immovable; raise the hand to the height of the mouth; move the point quickly and smoothly to the front, nearly to the full extent of the arm, and as close as possible to the antagonist's weapon.

BEATING is abruptly touching your adversary's blade, striking your forte against his foible, thus startling him and getting openings to thrust. If he resists it, disengage at once and thrust. Should he employ a simple parry, mark feint one, two; if he uses a counter-parry, counter, disengage, or double.

THE BEAT AND DISENGAGEMENT resembles the first disengagement in one, two, and is made for the purpose of inducing the adversary to return to the place he occupied when the beat was made. You then immediately pass to the opposite side of his blade, in the manner described in the disengagement.

CUT OVER THE POINT.—Raise the foil with the hand (which is not drawn back at all), bring down the foil on the opposite side of the adversary's blade, the arm being extended during its fall to the horizontal position, then deliver the lunge.

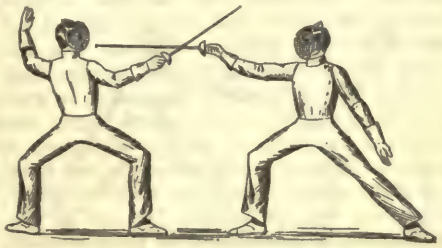
CUT OVER AND DISENGAGEMENT.—This is on the same principle as the one, two, and the beat and disengagement. On the adversary opposing the first movement (the cut) with a parry, the second movement (the disengagement) is made to the opposite side, and is followed by the lunge: the extension of the arm being divided between the two movements.

GLIDING THE WEAPON consists in moving your blade smoothly along your adversary's till the arm is nearly extended (being aware of his thrust and making sure of your own), and following the extension with a swift, direct blow. A quick advance, with a glissade, affords you openings either to mark feints or otherwise. If the adversary protects himself, taking the opposition, a disengagement may be made.

PRESSING.—Move your blade quickly forward along your adversary's, bearing upon his, and moving it out of line; commence at the foible and develop, or, if the opposition is taken, disengage.

REMOVING THE POINT.—If your opponent bears upon your weapon with a hard hand, suddenly remove your point a short distance. In his attempt to find new support for his blade, he will be very apt to give you an opportunity to make a direct blow or a disengagement.

PARRIES OR PARADES, which constitute the defensive part of the art, or the turning aside of the antagonist's blade, are ten in number: *prime, seconde, tierce, quarte* (sometimes written *cart*), *quinte, six, septime* or *sept, octave, contre-tierce,* and *contre-quarte.* Counter-tierce and counter-quarte are also called round parades. Of the ten, tierce, quarte, quinte, and six are



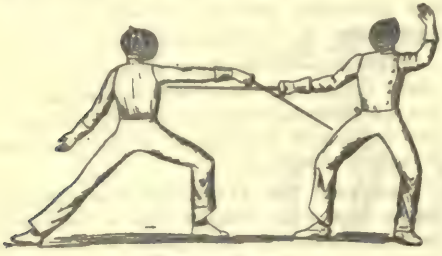
TIERCE PARRY

The thrust *in tierce,* or for the right side of the body, on the high lines, is parried by raising the foil and striking the opponent's weapon *to the right,* as in the left-hand figure.

called simple parries, as the weapon is but slightly moved from the position of guard. (According to another division, there are six simple parries: *quarte, tierce, circle, octave, prime,* and *quinte.*) Prime, seconde, sept, and octave are called half-counters, as the point describes a half-circle in effecting the parry. The remaining two are called counters; the point describing a curve and

returning to its original position. The chief parries (the others are used in exceptional cases only) are *tierce*, which defends the upper part of the body to the right; *quarte*, which defends the upper part to the left; and *seconde*, which defends the lower line.

PRIME is the most natural parry, the position being almost that one would assume in drawing his sword from the sheath on



SECONDE PARRY

This is the defence for a thrust *in seconde*, or for the right side of the body, on the low lines. It differs from prime in the fact that the handle of the foil is lower, but the movement of striking the opponent's foil to the right is the same as in tierce.

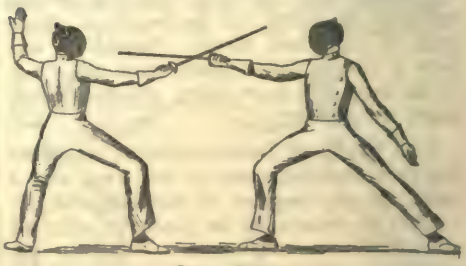
being attacked. The hand (in pronation) is raised as high as the forehead, and opposite the left shoulder, so that the fencer can see the antagonist's face under his wrist. The elbow is lowered somewhat; the blade of the foil is almost horizontal, but the point is rather lowered toward the ground. The point must describe a curve, so that the blade will cut the line of approach of the opposite weapon. As this parry throws the right side of the body open to the adversary's weapon, it is good play to disengage from left to right, and deliver a rapid thrust at the adversary, in order to anticipate him before he can bring his own sword round for another thrust. His point will be thrown far out of line, so that he is behindhand in point of time. This parry is the only one that can be used to turn aside every blow that can be made from the position of guard, and is a very useful one for fencers of short statures, as they can sometimes get in their blade under their adversary's arm after parrying his thrust.

The other parry, defending the opening inside above the hand, is *quarte*. The right hand is moved a few inches across the body on the inside, neither in pronation nor supination, but with the thumb uppermost; the elbow close to the body; the point of the foil at the height of the eyes and slightly beyond the under line. In this, as in all simple parries, the very movement which has guarded the body on one side has exposed it on the other.

TIERCE.—This parry is used when the exposed part *outside above* the hand is assailed. It is formed, from the middle guard, by turning the hand with the nails downward, and crossing to the opposite side some six or eight inches; the hand and point at the same elevation as before. If, however, the attack is made *under* instead of *over* the hand, the proper parry is:

SECONDE.—In this the hand is to the right, a little higher than the right hip, well in front and in pronation; the arm straight without stiffness; the point a little lower than the hand, and slightly outside the exterior line. If the attack is delivered at the *inside under* the hand, the proper parry is *sept*.

QUINTE.—Used to parry a low disengagement from tierce, is formed by lowering the hand diagonally, placing it in front of the left side at the height of the groin, the nails to the left. The point should be arrested as nearly as possible on a line with the opponent's right shoulder. *Six*, formerly called *tierce parry*, is formed from the middle guard, as follows: turn the hand in pronation and move it opposite the



SIXTE PARRY

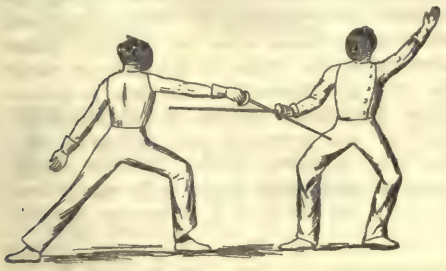
Like tierce, this parry is used to protect the upper right-hand side of the body; the foil being moved to the right sufficiently to meet and turn aside the opponent's thrust. The hand is in supination.

right side. Put the point in front of the antagonist and at the height of the crown of the head.

SEPT or DEMI (*half*) circle is formed from middle guard and is used to parry blows at the waist. In this the hand is to the right in supination, at the height of the shoulder; the arm half extended; the point to the left, at the height of the breast or shoulder.

OCTAVE.—In this the hand is held as in

quarte; the foil hilt is kept lower than that of the adversary; the blade is almost horizontal, the point being only slightly lower than the hilt and directed toward the body of the adversary; the point in sinking describes a slight curve. Octave generally meets the opposing blade before the point can be fixed properly; moreover, it brings



SEPTIME PARRY, OR DEMI-CERCLE

This movement is intended as a defence from a thrust to the left side of the body, on the low lines. It is executed by describing a semicircular movement to the left, so as to meet and turn downward your opponent's foil.

the point so near the adversary's body that he does not venture to make another thrust until he has removed the foil.

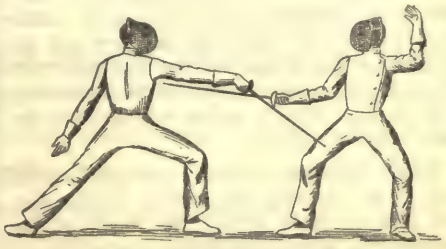
COUNTER-PARRIES. — As has been said, simple parries guard one opening only; counter-parries are devised so that each is capable of protecting the entire front, and all are formed on the same plan. A counter-parry is a full circle in the position of hand and direction of blade of its simple. The parries of positive value are *counter-tierce* and *counter-quarte.* The former is executed thus, according to Kelton: Being engaged in tierce, when the antagonist disengages at the "left," lower the point with a quick bend of the wrist, passing it under the approaching weapon, and throw it off to the right. Counter-quarte is made by retaining the hand in the position of quarte while the foil describes a circle, descending on the inside and returning by the outside to the place of its departure.

DOUBLES are separate movements to deceive counter-parries, and must be made connectedly and without allowing your adversary's blade to overtake yours. If you threaten your man by a disengagement to the outside, and if, instead of tierce, he parries by counter-quarte, the double is made by your disengaging a second time to the same side as the first, his counter-quarte having replaced the blades in the positions they occupied previous to your disengagement. You will then have an opening and can finish the attack by the lunge.

A DISENGAGEMENT is made as a defence as well as an attack, and is executed both under and over the wrist or foils. A disengagement over the arm may be parried with tierce or prime, and if made low by the parry of circle; from the position of octave, by quarte, or, when the thrust is low, by circle; from the position of quinte, by prime. Quarte and tierce are also correct parries against this thrust. To disengage below from tierce or quarte, lower the point by bending the wrist and move it to the front at the same time, just under the blade of the antagonist. To disengage by cutting over the point, make a feint or an attack on your opponent's foil; then raise your blade over his point and as close as possible to it.

COUNTER-DISENGAGEMENT.—In this, which is used to avoid the counter-tierce and counter-quarte parries, move your point entirely around the adverse blade, describing a very small circle near the shoulder of the foil, and follow the movement with a blow.

RIPOSTES are return thrusts delivered after parrying, and are of three kinds: (1) the direct or straight, a thrust in the line of the parry, without moving the foot; (2) the riposte with a change of line or some



OCTAVE PARRY

This movement, like septime, is in the form of a half-circle, only made *to the right,* in order to deflect the thrust intended for the right side of the body on the lower lines.

preparatory movement; (3) the riposte with a pause when the touch of the steel is abandoned, so that the adversary may half make or indicate a parry which the ripostting fencer can nullify. Ripostes are usually attempted after quarte, quinte, six, and tierce, counter-quarte, and counter-tierce parries. The riposte after six, which can be delivered with more certainty and effect

than any other, is made by raising the hand as high as the head, the thumb turned directly down; lowering the point over the antagonist's guard, and delivering the blow at the "right" or disengaging below.

To MENACE, advance your point quickly by a partial extension of the arm on the engagement side, as if about to make a direct blow. Maintain the opposition in menacing after a parry.

To CROSS, hold the hand high, turn the blade over that of the adversary, and form the parry of seconde or sept (demi-circle), thus getting command of his weapon and obtaining an opportunity of attacking below. Crossing comes into service when the antagonist ignores a feint, and extends his blade, presenting it at the breast.

BINDING THE BLADE is brought into play when the foible of the adversary's blade is controlled after a successful parry. If he disengages from quarte below, and his blow is parried with sept, an opportunity is given to bind his weapon by turning the blade under his, and, with a quick motion of the wrist, raising it and throwing it off to the right. *Flanconnade* is the principal way of binding, and it is also made as a riposte. The attack of flanconnade is commenced when the blades are primed in quarte, and it is parried either by octave or quinte, or by the parry of quarte.

To ENCIRCLE (after parrying six), raise the hand, master your adversary's foible with your forte, then (as he rises and attempts to guard against the riposte) turn or slide the blade around it without quitting it, and riposte below or cut over the point at the left.

TIME THRUSTS, which have been called the most scientific movements in fencing, are attacks made before the finish of the adversary's attack made in opposition on a complicated attack, and intended to intercept the line where such an attack is meant to finish. They are of two kinds, in the execution of one of which it is necessary that the blades should cross each other; for the completion of the other, the blades need not even meet. Time thrusts *in opposition* are two in number: *over the arm*, and in *octave*, the former being applicable to every kind of thrust, provided the lunge is made upon the outside; lunges directed to the inside of the body or under the arm are exposed to the time in octave. Time thrusts, or blows, in which opposition is not essential, are delivered at a foe who advances within distance uncovered, or who makes a too wide engagement, or quits the blade in a dangerous position.

THE SALUTE.—The etiquette of fencing requires that before engaging in an assault, the combatants shall salute. As Kelton describes it: "The fencers, on first taking the position of guard, rise, salute with their weapons each other, and, if there are spectators, on the right and left. They then resume guard in tierce; one disengages first at the 'left,' then at the 'right,' the blows being delivered with a loose hand, so that the weapon, on being parried, will be turned and the point thrown to the rear, the parrier at the same time lowering his point out of line. After a few repetitions of these disengagements, the first fencer will discontinue and will so indicate by an *appel* (two blows of the right foot on the ground), both rising. The guard of tierce is again resumed, and the other fencer makes the same disengagements. On appeling and both rising, the salute of the weapon will terminate the exercise, and the assault will begin." Etiquette also requires that if your adversary drops his foil by accident or in consequence of a smart parry of yours, you should pick it up and present it to him politely.

JIU-JITSU

TWENTY-FIVE hundred years ago, when our ancestors in the British Isles and on the nearby parts of the Continent dwelt in the most primitive houses and clothed themselves in the skins of wild beasts, the Japanese enjoyed a fairly high state of civilization. Yet in both Japan and Europe the warrior was looked upon as the highest type of manhood.

In Japan, the art of war was then confined to a class of military nobles, or knights, known as the *Samurai.* Having much idle time on their hands, and being an ingenious people, these men began to devise sports to make the time pass pleasantly, and at the same time develop their bodies for the rigors of campaigning. So that wonderful system of self-defence, known as *jiu-jitsu,* was born and slowly developed. The principles of the system were kept secret, being passed down under oath from father to son. It was forbidden to show any of the "tricks" to persons not members of the *Samurai.*

When the present Emperor of Japan ascended the throne, one of his first acts was to abolish the *Samurai* as a class. For that reason the need of secrecy as to *jiu-jitsu* gradually lapsed. Nowadays, any traveller in Japan may take the complete course in the science. A few teachers have also come to this country, although up to date comparatively few Americans have interested themselves in the study. This is a pity, for no known system of athletics will do so much to develop the body in a normal way. Nor could any of our boxers or wrestlers overcome a Japanese adept in *jiu-jitsu.*

While the primary object of this system is to perfect an invincible method of self-defence, its manœuvres serve very well for a course in athletics that ensures "muscles of steel and bones of granite," after a few months of faithful daily practice. The reader who thoroughly practices, will soon find himself able to cope easily with *any* adversary, since everything depends upon rapidity of movement.

USEFUL TRICKS FOR ORDINARY SELF-DEFENCE

EVERY trick in *jiu-jitsu* is based on a patiently studied principle of anatomy, the aim being always to injure a muscle or a bone in such fashion that your opponent is willing to give up the contest. An adept could, in a twinkling, break both arms of his assailant, yet bones seldom are broken, for the reason that the assailant is quickly astounded and convinced of the folly of keeping up the contest. In this respect, *jiu-jitsu* is the most humane form of bodily contest, as its use ends a fight without any permanent ill effect upon either contestant.

TWISTING THE WRIST TO THROW

Figure 1 shows the first and easiest trick in the system. Practice it with a friend of your own size, weight, and strength. Let your friend extend his left hand as if to shake hands. Take that hand with your right hand, fingers and thumb pointing downward, while his hand should be thumb uppermost. Place the ball of your thumb between the last two knuckles of his hand, pressing severely. There is a muscle between these two knuckles a strong pressure upon which will cause a good deal of pain, and a little practice on your own hand will enable you to find it instantly thereafter.

Now, while the ball of your thumb rests

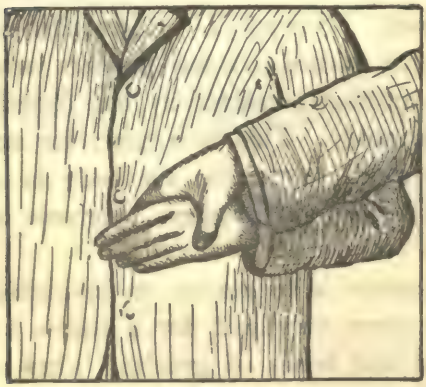


FIG. 1.

as directed, the fingers of that hand should rest over the thumb and on the palm of the hand of your adversary. You are now, if directions have been closely followed, in position for the trick. Give your opponent's hand and wrist a quick strong twist from right to left, making the turn as complete as possible. Your opponent will fall to the floor.

PRESSING WRIST AND HEAD TO THROW

In time, after months of practice, you will be able to throw an opponent, no matter how much stronger he is than yourself.



FIG. 2.

But at first, if you have an opponent much stronger than yourself, it may be well to employ the method illustrated in Figure 2. Take the hand grip in the same way as described in the preceding paragraphs. Place your right foot behind his left foot, in order to trip. At the same time throw your open left hand against the right side of his head. Simultaneously twist his left wrist, push against his head, and employ your foot in the trip.

In case of seizing your opponent by the right hand, all the above directions are of course reversed.

CLINCHING THE ARM TO THROW

After fully mastering the above manœuvres the student of *jiu-jitsu* is ready for the next. (Figure 3.) Close your left hand around the left wrist of your opponent, forcing him to extend that arm. At the same time throw your right arm over his left arm *at the shoulder*. In this position

force your right arm under his left arm and with your right hand clutch your left wrist. In this attitude bear with all the weight you wish upon your right arm, and you will momentarily cause your opponent to feel a great deal of pain in his left arm. The whole trick lies in getting your right arm as high up as possible against his left shoulder. Should he attempt to strike you in this clinch, you will find it in your power to swing him around as much as you wish; you will avoid the blow from his right fist and will at the same time give him acute pain as long as he resists. An extra wrench, while in this clinch, will throw your opponent. As in the foregoing and in all these exercises, whenever you seize your opponent by the other hand or arm than the one indicated the directions should be reversed.

HOLDING OFF AN ADVERSARY

Now comes one of the prettiest grips known to elementary *jiu-jitsu*. Again seize your opponent by the left wrist, wholly and tightly inclosing it with your left hand. Throw your right arm under his left arm, holding him at the nape of the neck with your open right hand. ***The real trick in this manœuvre is to keep your right arm straight and rigid.*** Hold tightly to your adversary's left wrist, and, with your rigid right arm, keep his head away. It will be impossible for him to strike you with his



FIG. 3.

right fist. At the same time, by any forward wrench, you can cause him such pain in his captive left wrist that he will be glad to abandon the now unequal contest. Figure 4 explains the position to take.

THE PUSHING HOLD

Next, for a breathing spell, we will attempt a manœuvre that does not bear directly upon self-defence, yet it offers one of the best-known methods of developing every muscle in the body. Stand close to each other, breast to breast. Spread your feet as far apart as they will go. Extend your arms horizontally, the opposite hands clutching each other. Maintaining this po-

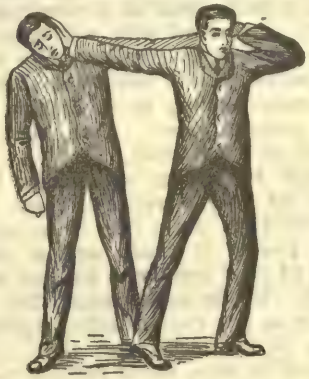


FIG. 4.

sition as rigidly as possible, each contestant should strive to press the other backward. Finally, let one or the other, still keeping his arms horizontal with the floor, bring his arms rigidly in front of him, forcing his opponent to do the same, and thus obliging that opponent to yield two or three feet more. This exercise, if persisted in for several minutes every day for a few months, will equip both contestants with muscles of steel. It is undoubtedly the best all-around exercise, considering the amount of time required daily, that is known to any system of athletics.

THE THROTTLING HOLD

Take a careful look at Figure 5. This illustrates the most decisive way of choking an opponent that is known. Place both hands inside your opponent's collar, the hands being nearly back to back. In this position the second knuckles of the forefingers should rest, on either side, just at the back of the "Adam's Apple." Having secured this grip, twist the hands closer together, applying most of the pressure with the second knuckles of the forefingers. A complete stoppage of breath follows. In an ordinary choking, a powerful enemy is able to shake himself free. When, how-

ever, the manœuvre described in this paragraph is faithfully followed, he has no chance to free himself, and must quickly yield. The more fiercely he struggles the harder you apply the pressure, and thus the sooner he reaches unconsciousness.

THROWING OVER THE HEAD

In Figure 6 is portrayed a trick that can not fail to astound a new hand at *jiu-jitsu* the first time it is tried upon him. This trick must be tried in a room the floor of which is covered with soft mattresses or on a haymow, *or elsewhere that a soft fall is assured.* Each contestant should be in his underclothing, or in bathing costume, and without shoes. Each must wear a jacket of tough cloth.

Begin by seizing with either hand the lapels of your adversary's coat. As soon as you have done this, raise your right foot, placing it firmly against the fleshy front of your opponent's leg just below the crotch. In the same instant, hop as close to him as you can. Holding tightly to the lapels of his jacket and with your right foot still in place, throw yourself over backward, carrying him with you. Though your opponent be much heavier than yourself, he can not help flying over your head, and will land on his back beyond you. This trick can not fail, if properly carried out, nor can it result in any injury to either contestant if the double fall is made on a soft enough surface. Of course you know what is coming, while your opponent does not. You will, therefore, have the presence of mind to spring up instanter and throw



FIG. 5.

yourself upon him, pinning him where he has fallen before he has had time to recover from the daze in which the unexpected trick has left him.

TO DISABLE THE ARM AND THROW

In order to overpower an adversary by rendering his arm useless and throwing him, grasp him by the wrist, and, setting the point of your elbow above and inside the bend of his arm, pull his forearm upward toward his shoulder. This movement may be readily performed even on an



FIG. 6.

adversary stronger than yourself—the position of your elbow giving a leverage that is very difficult to resist. When your adversary's arm is thus raised he will be unable to lower it, and, by continuing the movement, he may be thrown backward.

FORCING THE HEAD BACKWARD

Another trick that will frequently prove of use, either when the others can not be successfully performed, or when you are grappled from behind, is to grasp your adversary by the right shoulder with the right hand, and, using that point as a fulcrum, to force his head backward by pressure with the forearm under his chin. If you can also hold him with the left hand, he may speedily be rendered helpless and so brought to terms.

TO THROW FROM A CLINCH OR BLOW

One of the neatest and most serviceable "tricks" of ordinary *jiu-jitsu*—one, also, that may be used by a woman in overcoming an assailant—consists simply in grasping the antagonist's hand and forcing it back against his shoulder. If he reaches

out to seize you, quickly grab his hand, preferably by the ends of the fingers—your hand meeting his so as to seize his fingers between your fingers and palm—and, before he has time to perceive your intention, force his hand upward and backward, bending his elbow, until his hand is against his shoulder. As may be readily discovered by experiment, a person seized in this manner can not resist with the arm you hold, and, if you are quick enough, you may push him backward to the ground. Do not fail to hold down an antagonist you have once thrown in this manner. The throttling hold already explained is the safest and most effectual, when your antagonist is much the stronger; although both his arms may be pinioned back, if you are strong enough to resist his struggles and do not wish to harm him.

The same movement may be successfully used by a man of sufficient strength in seizing the fist of an antagonist attempting to strike him. It requires greater strength and quickness, however, than is needed to work on the unclinched hands.

AGRICULTURE

AGRICULTURE is the art of cultivating the ground, and of obtaining from it the product necessary to sustain animal life.

The change from a state of nature, in which the human race must have first lived, to the pastoral, or to any high mode of living, must have been gradual, the work, perhaps, of ages. The race was doomed to toil, and necessity soon sharpened the power of invention. The agriculture of a people must be influenced by the climate and natural features of the country. Formerly its progress largely depended on the density of the population, but now, the iron horse and the giant steamer bear away the product of the farm, and the results of the labor of a few are reaped by the many, hundreds and thousands of miles away. This vast continent has been justly called the granary of the world. We shall now see how even the smallest farm may be managed so as to produce good crops and prove profitable to its owner.

SOILS AND THEIR TREATMENT

IN selecting a farm, or entering upon the cultivation of one already in possession, the farmer should, first of all, turn his attention to an investigation of the various soils of which its surface is composed.

All soils adapted to agricultural purposes are composed of two classes of substances —organic and inorganic. The inorganic parts are derived from the decay of animal and vegetable matter. The organic part of the soil is generally called vegetable mould, but scientific writers designate it as *humus*. To be fertile, a soil must contain a considerable portion of this organic matter. More than fifty per cent of *humus*, however, in a moist soil has an injurious effect, rendering it what is called *sour*.

Of the various soils several distinct classifications may be made. It will be well, at the outset, to consider them all as embraced in two grand classes—*heavy* or *light*. The distinction indicated by these terms is familiar to every farmer. He knows, too, that it is a predominance of clay which makes a soil heavy, and that an excess of sand or of gravel makes a soil what is called light.

Heavy soils, also often denominated cold and wet, are distinguished for their affinity for water, their tenacity, their softness when wet, and their hardness when dry. They are admirably adapted to wheat, oats, Indian corn, and the various grasses; hence they are sometimes styled *grass lands*, and

are generally susceptible of being made highly productive.

Light soils are easily cultivated, friable, dry, and warm; but their porousness renders them liable to drought and exhaustion. They are particularly adapted to rye, barley, buckwheat, and the tap-rooted plants.

Soils are chiefly made up of what are sometimes called the three primitive earths —silex (including sand and gravel), clay, and lime. As either of these predominates, it gives its peculiar character to the soil, whence we have the arrangement into three grand classes—sandy, clayey, and limy soils.

1. *Sandy Soils.*—A soil containing not less than seventy per cent of sand may be considered sandy, in the sense in which the term is here used.

2. *Clayey Soils.*—Clay with a mixture of not more than twenty per cent of sand forms a clayey soil.

3. *Limy Soils.*—Limy or calcareous soils are those in which lime, exceeding twenty per cent, becomes the distinguishing characteristic. Calcareous soils may be either calcareous clays, calcareous sands, or calcareous loams, according to the proportions of clay or sand that may be present in them.

4. *Loamy Soils.*—Loamy soils are intermediate between those denominated sandy and those with predominant clayey characteristics. There are sandy loams, clayey loams, calcareous loams, and vegetable loams.

5. *Marly Soils.*—Soils containing lime, but in which the proportion does not exceed twenty per cent, are sometimes called marly.

6. *Alluvial Soils.* Soils made up of the washings of streams are called alluvial. They contain portions of every kind of soil existing in the surrounding country, and are generally loamy and very fertile.

7. *Vegetable Moulds.*—When decayed vegetable and animal matter or *humus* exists in so great a proportion as to give the predominant character to a soil, it sometimes receives the name of vegetable mould.

8. *Subsoils.*—The stratum or bed on which a soil immediately rests is called the subsoil. Subsoils, like soils, may be either silicious, argillaceous, or calcareous.

Heavy soils are often stronger and more productive than light; but they require more labor for pulverization and tillage. They can not be plowed when very wet, nor so well when very dry.

Sandy and gravelly loams also contain clays, but in smaller quantity; so that they do not present the cloddiness and adhesiveness of heavy soils. Though possessing, generally, less strength than clay soils, they are far more easily tilled, and may be worked without difficulty in wet weather. They do not crack or break in drought. Indian corn, ruta-bagas, and some other crops, succeed best upon them. Sandy soils are very easily tilled, but are generally not strong enough. When made rich, they are fine for some succulent crops. Peaty soils are generally light and free, containing large quantities of decayed vegetable matter. They are made by draining low and swampy grounds. They are fine for Indian corn, broom corn, barley, potatoes, and turnips. They are great absorbers, and great radiators of heat; hence they become warm in sunshine and cold in clear nights. For this reason they are peculiarly liable to frosts. Crops planted upon them must, consequently, be put in late, after spring frosts are over. Corn should be of early varieties, that it may not only be planted late, but ripen early.

Each of these kinds of soil may be variously improved. Heavy soils are much improved by draining: open drains to carry off the surface-water, and covered drains, that which settles beneath. Heavy soils are also made lighter and freer by manuring; by plowing under coatings of straw, rotten chips, and swamp muck; and, in some rare cases, by carting on sand, though this is usually too expensive for practice. Subsoil plowing is very beneficial both in wet seasons and in drought; the deep, loose bed of earth it makes, receiving the water in heavy rains, and throwing it off to the soil above, when needed; but a frequent repetition of the operation is needed, as the subsoil gradually settles again.

Sandy soils are improved by manuring, by the application of lime, and by frequently plowing in green crops.

The great art of saving and manufacturing manure consists in retaining and applying to the best advantage those soluble and gaseous portions. Probably more than one-half of all the materials which exist in the country are lost, totally lost, by not attending to the drainage of stables and farm-yards. This could be retained by a copious application of straw; by littering with saw-dust, when saw-mills are near; and more especially by the frequent coating of yards and stables with dried peat and swamp muck, of which many parts of our States furnish inexhaustible supplies.

Our limits do not admit of many remarks on the principles of rotation. The follow-

ing courses, however, have been found among some of the best.

I. 1st year—Corn and roots, well manured.
2d year—Wheat, sown with clover-seed; 15 lb. an acre.
3d year—Clover, one or more years, according to fertility and amount of manure at hand.

II. 1st year—Corn and roots, with all the manure.
2d year—Barley and peas.
3d year—Wheat, sown with clover.
4th year—Clover, one or more years.

III. 1st year—Corn and roots, with all the manure.
2d year—Barley.
3d year—Wheat, sown with clover.
4th year—Pasture.
5th year—Meadow.
6th year—Fallow.
7th year—Wheat.
8th year—Oats, sown with clover.
9th year—Pasture or meadow.

The number of the fields must correspond with the number of the changes in each course, the first needing three fields to carry it out, the second, four, and the third, nine. As each field contains a crop each, in the several successive stages of the course, the whole number of fields collectively comprise the entire series of crops every year. Thus, in the list above given, there are two fields of wheat growing at once, three of meadow and pasture, one of corn and roots, one of barley, one of oats, and one in summer fallow.

Operations in the Order of Time.—The vital consequence of doing everything in the right season is known to every good farmer.

In reviewing the various items which are most immediately essential to good farm management, some of the most obvious will be—capital enough to buy the farm and to stock it well; to select a size compatible with these requisites; to lay it out in the best manner; to provide it well with fences, gates, and buildings; to select the best animals and the best implements to be had reasonably; to bring the soil into good condition, by draining, manuring, and good culture; to have every part under a good rotation of crops, and every operation arranged so as all to be conducted systematically, without clashing or confusion. An attention to all these points would place agriculture on a very different footing from its present condition in many places and with most farmers. The business then, instead of being repulsive, as it so frequently is to our young men, would be attended with real enjoyment and pleasure.

But in all improvements, in all enterprises, the great truth must not be forgotten, that success is not to be expected without diligence and industry. We must sow in spring and cultivate well in summer if we would reap an abundant harvest in autumn.

ANALYSIS OF SOILS

Chemical analysis shows that the organic parts of a soil are composed of *carbon, oxygen, nitrogen,* and *hydrogen.* The inorganic parts of a fertile soil, in addition to the silex, clay, and lime, of which we have already spoken, contain smaller quantities of magnesia, potash, soda, sulphur, phosphorus, chlorine, oxide of iron, and oxide of manganese. All these are essential to independent fertility.

To ascertain the percentage of sand which a soil may contain, dry a quantity thoroughly; weigh it; boil it in water; stir it in a convenient vessel, and when the sand has settled pour off the liquid, which will hold the fine clay, etc., in suspension; after doing this a few times, nothing will remain in the bottom of the vessel but nearly pure sand, which may be dried and weighed, and the quantity will show whether the soil be sandy, loamy, or clayey.

Any considerable quantity of lime in a soil is readily detected by pouring upon it a little muriatic acid, which may be obtained at any apothecary shop. So soon as this acid comes in contact with lime, if there be any, a brisk effervescence will take place, owing to the bubbling up and escape of carbonic acid gas.

1. *Texture of Soils.*—Considered in reference to texture, a soil may be described as essentially a mixture of an impalpable powder with a greater or smaller quantity of visible particles of all sizes and shapes. Now, although the visible particles are absolutely essential, their effects are, as it were, indirect; the impalpable powder alone exerting a direct influence upon vegetation, by entering into solution with the water and acids with which it comes in contact; for *plants are incapable of taking in solid matter, however minutely divided;* and it is in a liquid or gaseous form only that their food can be received. From this it will be readily understood how a soil may possess all the elements of fertility and yet be barren, on account of some of these elements

being locked up in it, as it were, in an insoluble condition. The stones and smaller visible portions of the soil are gradually but constantly crumbling down under the action of air, moisture, and other chemical agents, thus adding, from year to year, new impalpable matter to the soil. The greater the proportion of this impalpable matter, all other things being equal, the greater will be the fertility of the soil.

Soils must also be examined in reference to their consistency or tenacity, which is nothing more than the strength with which their molecules or particles are bound to each other by what is called, in the language of natural philosophy, the attraction of cohesion. Clayey soils have the greatest degree of consistency, and sandy soils the least. Both extremes are unfavorable, a medium in this respect agreeing best with vegetation.

2. *Depth of Soil.*—A deep soil has not only the advantage of giving the roots of plants a wider range and a greater mass of food, but it retains moisture better in seasons of drought, and is not so readily saturated in rainy weather. For the tap-rooted plants, such as beets, carrots, parsnips, etc., depth of soil is particularly important.

3. *Colors of Soils.*—The brown and red soils are generally the best. They are termed warm, and are mostly loamy and fertile. Yellow and gray indicate clayey soils, which are cold in their nature. Black generally indicates peat or deep vegetable mould. Dark-colored earths absorb heat more rapidly than others, but they also allow it to escape with equal readiness.

4. *Humidity of Soils.*—Too great moisture is not less injurious to a soil than extreme dryness. The proper medium should be sought, and where land is too wet, thorough underdraining should be practiced.

5. *Influence of Subsoils.*—A subsoil of clay beneath a clayey soil is unfavorable; but beneath a sandy soil it is beneficial, especially if deep plowing and subsoiling be resorted to for the purpose of improving the latter. On the same principle a sandy or gravelly subsoil is desirable under clayey soils. A calcareous or limy subsoil is beneficial to both clayey and sandy soils.

6. *Position and Form of Surface.*—Sandy soils are most fertile when flat and situated lower than the surrounding country. On the declivities of hills, such soil is of less value, as it is liable to become parched by droughts and washed away by rains. Clayey soils, on the contrary, especially where the subsoil is impermeable, are favorably situated when on a hillside. Southern and eastern exposures are favorable to early vegetation, and, in a cold climate or with a clayey soil, are very desirable for many crops.

1. *Improving Clayey Soils.*—One of the principal defects of clayey soils, especially where they rest upon a subsoil of the same nature, is the excess of water which is held in them. The only effectual way, in a majority of cases, to get rid of this is by thorough underdraining. Open drains or ditches, though less effectual, are useful. In some cases, "water furrows," terminating in some ravine or ditch, serve a very good purpose.

Lime is exceedingly useful as an ameliorator of clayey soils. Gypsum or plaster of Paris, ashes, coarse vegetable manures, straw, leaves, chips, etc., are also very useful, adding new materials to the soil, and tending to separate its particles and destroy their strong cohesion. In cold climates, plowing clayey lands in the fall, and thus exposing them to the action of the frosts and snows, has a beneficial effect. At the South, where there is little frost, and frequent and heavy rains occur during the winter, the effect of fall plowing is very injurious. Clayey lands must never be plowed when wet.

Where a clayey soil rests upon a sandy subsoil, its improvement is easier, as deep plowing, by which a portion of the subsoil is turned up and mixed with the soil, soon modifies it very sensibly.

2. *Improving Sandy Soils.*—Sandy soils require a treatment in most respects the reverse of that applied to clayey soils.

Lime and gypsum, which render clayey soils more friable, increase the adhesiveness of sandy soils, and when cheaply obtained furnish a profitable dressing. Ashes may also be applied with great benefit, as may vegetable manures and vegetable mould. Sandy soils are plowed to the greatest advantage when wet, and are improved by the frequent use of a heavy roller. Pasturing sheep upon them is very beneficial.

Gravelly soils (except calcareous gravels) are more difficult of improvement than sandy soils, and are most profitably appropriated to pasturage. Sheep will keep them in the most useful condition of which they are capable.

3. *Improvement of Vegetable Soils.*—Soils composed mainly of *humus* or vegetable mould should be drained from all excess of water. Then the hummocks, if any, must be cut off, dried, and burned, and the ashes spread over the surface; after

which sand, fine gravel, ashes, air-slaked lime, and barnyard manure should be liberally added.

4. *Management of Subsoils.*—In subsoil plowing a common plow goes first, and is followed in the same furrow by the subsoil plow, which thoroughly breaks up the subsoil to the depth of from twelve to sixteen inches, without displacing it. At subsequent plowings portions of this subsoil are turned up by allowing the common plow to run more deeply than before; but care should be taken not to bring it up too rapidly or in too large quantities.

Subsoil plowing should be repeated once in five or six years; going each time a little deeper than before, till the greatest practical depth is attained.

Subsoil plowing is not applicable, however, to all lands. Where the subsoil is loose and leachy, consisting of an excess of sand or gravel, it is not only unnecessary but positively injurious.

The gradual mixing of the subsoil with the soil which results from subsoil plowing is especially beneficial to lands which have been for a long time under cultivation, and have become partially exhausted.

Where underdraining is required, it should precede the subsoiling, and the surface of the drains should be sufficiently below the surface not to be disturbed by the subsoil plow.

With the exception we have noted, where the subsoil is loose and leachy, subsoil plowing, though expensive, will most certainly "pay," as experience has amply proved.

MANURE

The productive power of soils subjected to cultivation is gradually exhausted by the process. Some of the alluvial lands of Virginia produced large annual crops of corn and tobacco for more than a century, without any return being made to them for the elements of fertility abstracted; but these lands are now nearly valueless.

The average yield, per acre, of the cultivated lands of the State of New York has decreased since 1844. In corn, the decrease is nearly four bushels per acre; in wheat, nearly two bushels; and in potatoes, partly owing to the rot, no doubt, twenty-two and a half bushels.

These are instructive facts, and should cause the farmer to pause and reflect.

Both the organic and inorganic parts of plants are made up from their food, which must, of course, consist of both organic and inorganic materials. The former are obtained partly from the soil and partly from the air; the latter come exclusively from the soil. A fertile soil must therefore contain, in sufficient quantity and in an available form, all the constituents of plants; and to maintain its fertility under cultivation, these constituents must be supplied in the form of manures as fast as they are taken up by the crops produced.

I.—VEGETABLE MANURES

Vegetable manures are not so energetic in their action as those of animal or mineral origin, but their effects are more durable; and the wise agriculturist will avail himself largely of the cheap means of ameliorating his soil which they afford.

1. *Green Crops.*—Plowing in green crops, such as clover, spurry, sainfoin, buckwheat, cow-peas, turnips (sown thickly), Indian corn, etc., is one of the best modes of renovating and sustaining a soil. Worn-out lands, unsalable at ten dollars an acre, have by this means, while steadily remunerating their proprietors by their returning crops for all the outlay of labor and money, been brought up in value to fifty dollars an acre.

For the Northern States red clover has been found best fitted for a green manure; but in particular cases some other crop may be used with greater advantage. At the South, the cow-pea (which is no pea, but a bean) is considered the best fertilizer.

Clover and most broad-leaved plants draw largely for their sustenance from the air, especially when aided by the application of gypsum. By its long tap-roots, clover also draws much from the subsoil.

The proper time to turn in most plants used as green manure is at the season of blossoming.

The same effects follow the plowing of grass lands, and turning under the turf; and the thicker and heavier the sward the better.

2. *Straw, Leaves, etc.*—Straw, leaves, hay, are usually applied to the lands after they have either been worked over by animals and mixed with their manures, or composted with other substances and decomposed; but clayey soils are benefited by their application in an undecayed state.

Potato-tops or haulm; bean haulm; weeds, pulled before they have seeded, and all kinds of vegetable refuse, are readily decomposed by the addition of a small quantity of animal substances or lime, and should be carefully composted.

3. *Sea-weed.*—Sea-weed and pond-weed form valuable manures. The former is particularly rich in the substances most needed by our crops.

4. *Cotton Seed.*—At the South, cotton seed is much used as a manure, and is very valuable for that purpose. It is applied at the rate of from eighty to a hundred bushels per acre. It may be sown broadcast and plowed in during the winter, when it will rot before spring, or it may be left in heaps to heat till its vitality is destroyed, when it may be thrown upon the corn hills and covered with the hoe or plow.

5. *Turf, Muck, Mud, etc.*—Rich turf, full of the roots of the grasses and decayed vegetable matter, is valuable as an absorbent of animal or other manures in compost heaps. Mixing it with lime, and leaving it several weeks to decompose, is a good preparatory process.

Swamp muck, pond mud, and the scourings of old ditches, are exceedingly rich in vegetable matter, and are all very useful as manures.

II.—ANIMAL MANURES

These comprise the flesh, blood, hair, bones, horns, excrements, etc., of animals. They contain more nitrogen than vegetable manures, and are far more powerful.

1. *Stable Manures.*—The standard manure of this country is that from the stable and barnyard. The principal varieties are those of the ox, the cow, the horse, and the sheep. Of these, that of the horse is the most valuable in its fresh state, but is very liable, as ordinarily treated, to lose much of its value by fermentation; that of the sheep comes next; while that of the cow is placed at the bottom of the list, because the enriching substance of her food goes principally to the formation of milk. That of the ox is better.

All the urine as well as the solid excrements of animals should be carefully preserved. *The urine of three cows for one year is worth more than a ton of guano, which would cost from fifty to sixty dollars.* Various methods of preserving and applying it will suggest themselves to the intelligent farmer.

Stable manures should be sheltered from the sun and rain, and fermenting heaps so covered with turf or loam as to prevent the escape of the fertilizing gases. Plaster, as in the case of urine, will aid in retaining the ammonia.

2. *Hog Manure.*—The manure of swine is strong and valuable. Swamp muck, weeds, straw, leaves, etc., should be thrown into the sty in liberal quantities, to be rooted over and mixed with the dung. In this way from five to ten loads of manure per annum may be obtained from a single hog.

3. *The Manure of Fowls, etc.*—The manure of hens, turkeys, geese, ducks, and pigeons should be carefully collected and preserved. Professor Norton says that three or four hundred pounds of such manure, *that has not been exposed to the rain or sun,* is equal in value to from fourteen to eighteen loads of stable manure.

4. *Guano.*—Of its value as a manure there can be no doubt; but circumstances must determine whether in any given case it can profitably be purchased and applied at the prices at which it is held.

In applying guano, care should be taken that it does not come in contact with any seed, as it might destroy its vitality.

5. *Fish Manures.*—These are available near the seacoast only, where they furnish an important source of fertility, which should not be neglected. The flesh of fish acts with great energy in hastening the growth of plants. It decomposes rapidly, and should be at once plowed under, or made into a well-covered compost heat.

6. *Flesh, Blood, Hair, etc.*—Dead animals, the blood and offal from slaughter-houses, are among the most powerful of fertilizers—equal to guano and the other costly manures. Every animal that dies should be made into compost at once.

Hair, woollen rags, leather shavings from the shoe-shops, and all other refuse animal matters, should be carefully preserved and composted, as they make very rich manure.

7. *Bones.*—The value of bones as a manure is just beginning to be appreciated in this country. They unite some of the most efficacious and desirable organic and inorganic manures.

Bones make a cheap as well as a rich manure, and no thoughtful farmer will suffer one to be wasted about his house.

III.—MINERAL MANURES

1. *Lime.*—Lime is applied to land in three different states—as quicklime, slaked lime, and mild or air-slaked lime. To cold, stiff, newly drained land, especially if there exist in it much of acid organic compounds, it is best to apply quicklime or caustic hydrate (slaked lime), as it will have a more energetic effect in ameliorating it. On

light soils mild or air-slaked lime is considered most beneficial. It is best to apply lime frequently and in small quantities, so as as to keep it near the surface and always active.

2. *Marls.*—In true marl, the principal element of fertility is the lime which it contains; but its value is increased by the greater or less proportion of magnesia and phosphoric acid which are usually combined with it.

A valuable mineral fertilizer generally called marl, but which contains comparatively little lime, abounds in parts of New Jersey and Delaware. Its effects upon the light, sandy soils of New Jersey is very striking indeed.

3. *Gypsum.*—Gypsum, or plaster of Paris, is a sulphate of lime, and has been found one of the cheapest and most powerful fertilizers derived from the mineral kingdom. On grass lands it is best to sow it in damp weather or while the dew is on. Sow broadcast at the rate of a bushel to the acre. Seed potatoes may be wet and rolled in plaster before planting with decided advantage; and we know of no better way of applying it to corn than to give the seed a coat before putting it in the ground.

4. *Common Salt, etc.*—Common salt, as an ingredient in compost, is of great service. As a top dressing for grass lands—especially those of a loamy texture—it is invaluable. Mixed with wood ashes and lime, in the proportion of one bushel of salt to three of ashes and five of lime, it constitutes a very energetic manure for Indian corn.

A very useful and energetic mixture is made by the following simple process:

"Take three bushels of unslaked lime, dissolve a bushel of salt in as little water as will dissolve it, and slake the lime with it. If the lime will not take up all the brine at once—which it will if good and fresh burned—turn it over and let it lie a day and add a little more of the brine; and so continue to do till it is all taken up."

Brine which has been used for salting meat or fish is still more valuable than that newly made, as it contains a portion of blood and other animal matter.

Whenever refuse nitrate of potash—that is, common saltpetre—or refuse liquid in which it has been dissolved for pickling meat, can be procured, it should be carefully preserved and mixed into a compost heap.

5. *Ashes.*—Ashes compose the entire inorganic parts of plants. Returned to the soil, they may again be taken up by the growing vegetation. Their great usefulness as a manure is evident and undisputed.

Leached ashes have lost some of their value, being deprived of the greater portion of their potash and soda, but are still very useful as manures.

Coal ashes are less valuable than wood ashes, but are by no means to be neglected by the farmer.

Soot is exceedingly valuable as a manure, and the small quantity produced should be carefully saved.

IV.—MANAGEMENT OF MANURES

1. *Fermentation.*—That great loss takes place when manure ferments *uncovered by some absorbent* of the fertilizing gases is clear to every observer and thinker. See to it, then, that all fermenting manure is covered with turf, muck, charcoal dust, sawdust, or plaster, to take up and retain the ammoniacal gases as they arise.

2. *Digging over Manures.*—The frequent digging over of barnyard manure, practiced by some farmers, while it promotes decomposition, also leads to great waste.

3. *Hauling Manure in Winter.*—The opinion is now gaining ground that, when it can be conveniently done, the best way to secure to the land the greatest possible benefit from stable and barnyard manure is to draw them at once, as fast as they are produced, to the fields where they are to be used, and either spread them at once or deposit them in heaps so small that no putrefactive fermentation will take place. In many cases, manures may be hauled in the winter with great economy, as the labor of the teams and hands is in less demand elsewhere.

4. *A Caution.—Never mix quicklime with any animal manure,* as it will greatly deteriorate the manure.

5. *Burying Manure.*—Here again doctors disagree. Some advocate burying manure very deeply, others slightly, and still others would leave it upon the surface. The best general rule, we believe, is to mix it as thoroughly as possible with every part of the soil. The roots will then be sure to find it. A few crops—onions and some of the grasses, for instance—must find their nutriment near the surface, as the roots do not extend deeply; for these a top dressing may be best.

6. *Importance of Texture.*—Far more important than the mere presence of fertiliz-

ing ingredients, or even the *chemical condition* of those ingredients, in many cases, is their mechanical texture and degree of pulverization. Hence it may be reasonably believed that the general introduction and free use of pulverizers, as the most effective harrows, clod-crushers, and subsoilers, assisted by tile-draining, may be of greater benefit to the whole country than the importation of a million tons of guano.

V.—COMPOSTS

Let nothing that is capable, when decomposed, of furnishing nutriment to your growing crops be permitted to go to waste about your premises. A compost heap should be at hand to receive all decomposed refuse. The best basis for this heap is well-dried swamp muck; but where this is not readily obtained, procure rich turf scraping from the roadside, leaves and surface soil from the woodlands and the sides of fences, straw, chips, corncobs, weeds, etc., aiding the decay of the coarser materials by the addition of urine or the lime and salt mixture mentioned in the previous section. Let this be composted with any animal matter found about the premises, or in the vicinity.

VI.—IRRIGATION

Irrigation is manuring by means of water. "The manner of irrigation must depend on the situation of the surface and the supply of water. When it is desirable to bring more water on to meadows than is required for saturating the ground, and its escape to the fields below is to be avoided, other ditches should be made on the lower sides, to arrest and convey away the surplus water."

Irrigation contributes to the growth of plants in several ways.

"The advantages of irrigation are so manifest that they should never be neglected, when the means for securing them are within economical reach.

"The increase from the application of water is sometimes fourfold, when the soil, the season, and the water are all favorable, and it is seldom less than doubled.

"Light, porous soils, and particularly gravels and sands, are the most benefited by irrigation."

CHEAP FERTILIZERS

The following fertilizers are all excellent for increasing the crop production per acre. These formulas are based on experiments successfully made at the Massachusetts Agricultural College. By following these simple directions the farmer may make his fertilizer at much less cost than he can buy it.

To produce 50 bushels of corn more than the natural product to the acre:

(1.) Nitrogen, 64 lb., in the form of sulphate of ammonia;

(2.) Potash, 77 lb., in the form of chloride of potash;

(3.) Phosphoric acid, 31 lb., in the form of muriate of superphosphates.

To grow 1 ton of hay to the acre more than the natural product:

(1.) Nitrogen, 36 lb., in the form of sulphate of ammonia;

(2.) Potash, 31 lb., in the form of chloride of potash;

(3.) Phosphoric acid, 12 lb., in the form of superphosphate.

To produce 100 bushels of potatoes per acre and their usual proportion of tops more than the natural production of the land:

(1.) Nitrogen, 21 lb., in the form of sulphate of ammonia;

(2.) Potash, 34 lb., in the form of sulphate of potash;

(3.) Phosphoric acid, 11 lb., in the form of superphosphate.

To produce 25 bushels of oats and the usual proportion of straw per acre more than the natural product of the soil:

(1.) Nitrogen, 10 lb., in the form of sulphate of ammonia;

(2.) Potash, 31 lb., in the form of chloride of potash;

(3.) Phosphoric acid, 8 lb., in the form of superphosphate.

To produce 1,500 lb. of dried leaf tobacco with the usual proportion of stalk more than the natural yield per acre of land:

(1.) Nitrogen, 149 lb., in the form of sulphate of ammonia:

(2.) Potash, 172 lb., in the form of sulphate of potash;

(3.) Phosphoric acid, 16 lb., in the form of superphosphate;

(4.) Lime, 160 lb., in the form of sulphate of lime (lime plaster).

Sow the appropriate mixture broadcast over the land, after the ground has been made ready. A great deal depends upon the evenness with which the fertilizer is spread.

DRAINING

Thorough drainage implies *covered* drains, and it is to the advantage of these mainly that we now desire to call the read-

er's attention; although open ditches and water-furrows are very useful in certain situations.

The principal benefits of a system of covered drains are succinctly and clearly stated in the following:

REASONS FOR UNDERDRAINING

(1.) It prevents water which falls from resting on or near the surface, and renders the soil dry enough to be worked or plowed at all times.

(2.) By rendering the soil porous or spongy, it takes in water without flooding in time of rain and gives it off again gradually in time of drought.

(3.) By preventing adhesion and assisting pulverization, it allows the roots to pass freely through all parts of the soil.

(4.) By facilitating the mixture of manure through the pulverized portions, it greatly increases its value and effect.

(5.) It allows water falling on the surface to pass downward, carrying with it any fertilizing substances (as carbonic acid and ammonia), until they are arrested by the absorption of the soil.

(6.) It abstracts in a similar manner the heat contained in falling rains, thus warming the soil, the water discharged by drain-mouths being many degrees colder than ordinary rains.

(7.) The increased porosity of the soil renders it a more perfect non-conductor of heat, and the roots of plants are less injured by freezing in winter.

(8.) The same cause admits the entrance of air, facilitating the decomposition of enriching portions of the soil.

(9.) By admitting early plowing crops may be sown early, and an increased amount reaped in consequence.

(10.) It economizes labor, by allowing the work to go on at all times without interruption from surplus water in spring, or from a hard-baked soil in summer.

CONDITIONS REQUIRING DRAINAGE

The conditions from which arise the principal causes of mischief to undrained land are thus stated by Munn in "The Practical Land-Drainer":

"(1.) Where water has accumulated beneath the surface and originated springs.

"(2.) Where, from the close nature of the substrata, it can not pass freely downward, but accumulates and forms its level or water line at a short distance below the surface; and

"(3.) Where, from the clayey or close texture of the soil, it lies on the surface and becomes stagnant."

Farmers are apt to consider land in which the second condition mentioned exists to be too dry to need draining, yet it is *cold* and *sour* late in spring, apt to bake hard in summer, and very liable to suffer from early frosts in autumn. There is no remedy but underdraining.

PRACTICAL DIRECTIONS

(1.) *Preliminary.*—The first thing to be done is to examine the field to be drained and determine the plan of drainage best adapted to effect the object in view, and the materials which may most economically be used in constructing the drains.

(2.) *Draining Springy Soils.*—Where the wetness to be remedied results from springs having their source in higher grounds above the field to be drained, the desired result is generally attained by making one or more drains across the declivity about where the low grounds of the valley begin to form, thus intercepting or cutting off the springs. These transverse drains must be connected with others made for the purpose of conveying the water collected in them into some brook, ravine, or other outlet which may be near.

(3.) *Direction of Drains.*—In cases characterized by either of the other conditions specified in the previous section, parallel drains should be cut *directly up and down the inclination of the field*, and emptying into a main cross drain at the lower side.

(4.) *Depth and Distance Apart.*—The experience of some of the most extensive drainers, both in this country and in Europe, seems to indicate, however, that for very heavy, clayey soils, from two and a half to three feet in depth and from twelve to thirty feet apart generally produce the most satisfactory results. More porous and friable soils may be successfully drained at greater depth and distance.

(5.) *Materials and Construction.*—The ditch excavated must be furnished with a permanent duct through which water may at all times pass freely off. This may be constructed of various substances—brushwood, straw, turf, clinkers from furnaces, wood, brick, stone, and tiles of burned clay. Of these, stone and tiles in their various forms, when they can be procured, are the only materials which we can unconditionally recommend.

Brushwood Drains.—Where no better materials are available these will be found,

while they last, quite effective, and they are far more permanent than might be supposed.

Stone Drains.—In reference to their mode of construction, stone drains are of various kinds. The simplest form is that in which the ditch or cutting is filled to the depth of nine or ten inches with small stones, covered with inverted turf, shavings, or something of the kind. The stones should be about the size of a hen's egg. Where larger ones are used, the earth is apt to fall into the cavities, or mice or rats make their burrows there, and the drain becomes choked. *The water should find its way into the drain from the sides, and not from the top.* In making stone drains in swampy or very soft ground it is sometimes necessary to lay a plank or slab on the bottom before putting in the stones, to prevent them from sinking before the soil shall become dry enough to be firm.

Tile Drains.—The first form of tile drain used was arched and made to rest on a sole or flat tile laid under it; but the more modern tile pipes are to be preferred, as they are smaller, cheaper, and more easily laid. Those with an oval bore are considered better than those with a round one. The tiles are, of course, placed in the bottom of the ditch, which must be smooth and straight. They are simply placed end to end and wedged a little with small stones, if necessary, and the earth packed hard over them. *The water very readily finds its way through the pores of the material and at the joints.* Collars or short outer tiles are sometimes used to go over the joints, to secure them against getting displaced. An inch pipe is sufficient for most situations.

The drains should be connected at the upper end of the field by a small drain running at right angles with them. It should be of the same depth as the other drains.

WILL UNDERDRAINING PAY?

This depends on circumstances. If naturally good, underdrained land can be obtained in your neighborhood for from $15 to $20 per acre, it would not pay in all probability to expend $30 per acre in underdraining low, wet, or springy land; but in all districts where land is worth $50 per acre, nothing can pay better than to expend from $20 to $30 per acre in judicious underdraining. The labor of cultivation is much reduced, while the produce is generally increased one-half, and is not infrequently doubled, *and it must be remembered that the increase is net profit.*

In reference to tile-pipe drains, it must be remembered that the ditch may be much narrower than when stones are used, thus making a considerable saving in the expense of digging.

LABOR-SAVING MACHINES

With all the progress of the nineteenth century husbandry made but few steps ahead before 1875. For some reason the farmer was the last to obtain his share in the advancement of that wonderful cycle. During the last twenty-five years the agriculturist has been offered many wonderful devices for saving the cost of labor.

In the far West the tiller of the soil has taken advantage of many new mechanical schemes for saving money. It has been only within the last ten or fifteen years that the farmer east of the Mississippi has realized to the full the opportunities that have been afforded him of vastly increasing the economy of the farm.

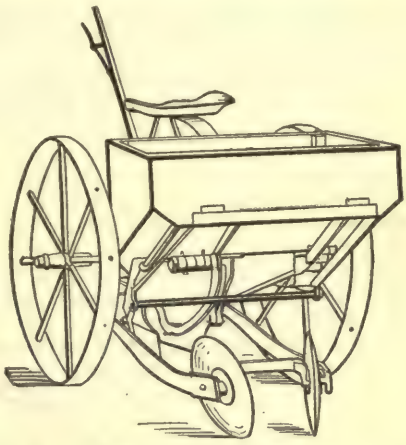


FIG. 1.—Machine Planter.

On the small farms of the East, those that run from ten to a hundred acres, many devices have come up within the last few years that double or treble the profits of farming. No crop is more universally or profitably adapted to Eastern States than that of the potato. In strong contrast with the old methods of hand-planting is a machine-planter of recent invention, as shown in Figure 1. This machine is adapted to dropping the seed in drills at several distances from ten to thirty-six inches apart.

This machine has the great advantage that the driver can see the potatoes dropping. He then knows whether the machine is depositing the seed properly or not, and

can detect the fact of the machine being out of potatoes as soon as it occurs.

The bottom of the hopper is constructed with two feeding channels which vibrate from the top of the hopper down to the bottom of the concaves, thus ensuring an even and steady flow of potatoes.

This machine is controlled by a simple and effective hand lever, which governs the

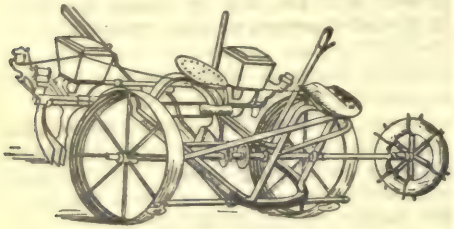


Fig. 2.—Corn Planter.

depth of planting and covering, and is readily changed by the operator without leaving his seat.

The marker is positive in operation, is constructed on the principles of the hand lever, has a spring catch, which holds it in an upright position when turning round, is readily operated by the hand catch, and can not fall when turning on hilly ground.

The machine is thirty-six inches wide from the centre of one drive-wheel to the centre of the other, which is quite an advantage over narrow-tread machines, which easily upset on hilly ground.

The price of such a machine is moderate, when considered in connection with the results. It can be purchased at from $65 to $80.

Figure 2 shows a corn-planter with check rower, of steel frame, with full hill drop planter and automatic reel. It has a thick and a thin plate, and can be used by putting on or taking off the drive-chain. When the machine is used as a drill it can be changed to drop seed for the several distances between ten and sixteen inches apart. It will plant in hills with the drill drop from two to six grains each by regulating the chain to different sprockets. By adding four sets of feed plates sixteen changes are possible. The check rower is fastened on the beam of the planter front, is directly connected with the valve rod, and has a long adjustment which brings the corn in check under the knot. The average price of this machine is $75.

Figure 3 shows another form of implement designed for planting field or ensilage corn, beans, peas or beets in hills, drills or checks. It is especially intended for the accurate distribution of fertilizers in full strength, wet or dry, without injury to the seed. The average price is $30.

Figure 4 shows a slightly different form of machine designed for the same purpose, and by many practical agriculturists considered to be superior.

Cheaper than either of the above, and suited to farmers of less means and acres, is the corn-planter and distributer of fertilizer shown in Figure 5. It has bent-wood frames, strongly bolted, and the covering wheel is adapted to crushing clods. There is a device for throwing in and out of gear at pleasure, while the operator has no need to stop the team. No marking of drills is required, and the price of this implement does not exceed $25, while in several good makes it can be obtained for a little less.

Figure 6 gives an excellent idea of a perfect grain drill that may be purchased at about $100.

It has large, strong wheels, well made. The frame and rolls are well proportioned, firmly framed and bolted, and of the best selected seasoned maple. The grain, phosphate, and grass-seed boxes are made of carefully selected and thoroughly seasoned lumber, and so formed and put together as to give the greatest strength and the most amount of room. The box covers are constructed by overlapping each other, to prevent any rain or moisture entering the boxes. The roll lever and latch are a novel feature for raising and lowering the teeth, which is easily done by the use of one hand only. There is a tube shifter, giving several different positions to the teeth, to

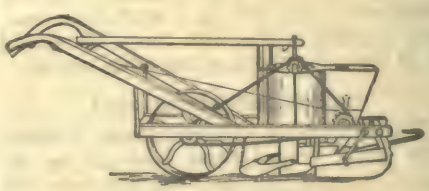


Fig. 3.—Field Corn Planter.

suit the condition of the soil, and is operated by a lever at the centre. The self-operating spring hoe is very simple and does away entirely with all wooden pins, and in passing obstructions always adjusts itself instantly to its original position. When once tried, the user will never return to the old wooden-peg hoe. The grass-seed is sown either in rear or front of the hoes, by a simple change, by an ac-

curate and even grass-seed distributer. The propelling power is placed in both drive-wheels (the same as in mowing machines) by ratchets, that engage with the hubs of both large wheels on a continuous polished steel axle, so that in turning right or left or moving straight ahead you have the same even, steady motion given to the distributers. This new principle of applying the power to both drive-wheels is readily understood and appreciated by all farmers, as it avoids all side draught, and gives a stronger and more certain motion to the drill, which never loses its motion in passing either way around an obstruction. The distributers are placed in the grain and fertilizer boxes in the most simple and practical manner, and their connection with the gate adjustments regulates the quantity. This machine is nicely balanced, and when loaded leaves but slight pressure on the horses' necks. Each drill is provided with whiffletrees and neck yoke. No change of loose cog or gear-wheels for regulating quantity is made. It has always the same unchangeable motion by one fixed gear-wheel, engaging directly with the axle, imparting motion instantly to the distributers, thereby making no skips in sowing when stopping and starting on the field. This machine changes its quantity by a new and perfect principle of gates or gauges, placed directly in the distributers and moving instantly at the will of the operator to the nicest adjustment of quantities, as shown by an indicator on the graduated dial.

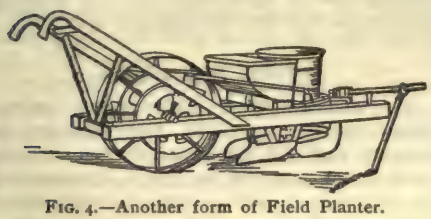


FIG. 4.—Another form of Field Planter.

One of the best of the improved harrows is the hinge harrow. This harrow may be folded double, or separated into two parts, for the convenience of transportation or other purpose. Either half may be lifted for any purpose while the implement is in motion; and the easy and independent play of the parts up and down upon the hinges enables the instrument to adapt itself to the surface of the ground in all places, so that whether going through hollows or over knolls or ridges it is always at work, and every tooth has an operation upon the soil.

The Geddes harrow and the Hanford harrow, triangular in shape, are also excellent implements; and for light grounds, free from stones and other obstructions, the Scotch or square harrow serves its purpose admirably.

THE CULTIVATOR

This is a useful implement for stirring the soil and killing weeds. It saves a great deal of hard labor; but must not be allowed to usurp the place of the plow where deep cultivation is required.

THE HORSE HOE

Allied to the cultivator is the horse hoe in its various forms. "Knox's patent has four teeth. The forward one is simply a coulter, to keep the implement steady and in a straightforward direction; the two sides or middle teeth are miniature plows, which may be changed from one side to the other, so as to turn the earth from the rows at first weeding, when the plants are small and tender, or toward them in later cultivation, at the option of the operator; the broad rear tooth effectually disposes of grasses and weeds, cutting off or rooting up all that come in its way. It is a thorough pulverizer of the surface, sifting the earth and weeds through its iron prongs or fingers in the rear, leaving the weeds on the surface to wilt and die, and the ground level and mellow. For hoeing carrots, turnips, etc., where the rows are narrow, the side teeth are taken out, and the rear tooth, with the forward one as a director to guide the instrument, hoes and mellows the ground between the rows very perfectly."

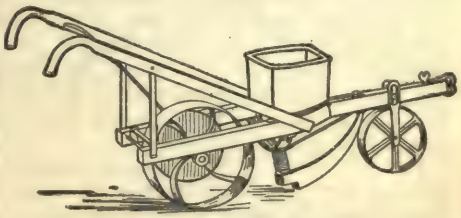


FIG. 5.—Fertilizer Distributer.

THE FIELD ROLLER

No good farmer will omit this useful implement from his list. In spring there is frequently great advantage in rolling lands recently sowed to grain and grass, as the earth that has been raised by the frost, exposing the roots of plants, is replaced by the

operation, with benefit to the growing crop. The roller is particularly beneficial on light lands, of soil too loose and porous to retain moisture and protect the manure from the

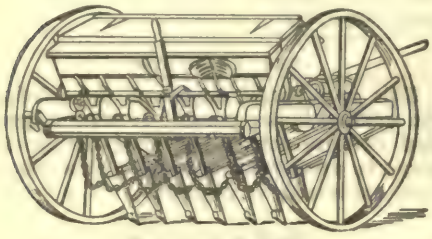


FIG. 6.—Grain Drill.

effects of drying winds and a scorching sun, and too light to allow the roots of plants a firm hold in the earth.

SEED SOWERS

Every farmer or gardener needs a seed-sower of some sort; but one of the smallest and simplest of the many kinds manufactured will serve the purpose of the majority of agriculturists.

THE HORSE RAKE

The utility of this simple implement is not fully realized, we are sure, or it would be more generally employed. A horse rake is not an expensive implement, and every farmer should have one. The old revolver is perhaps the best for general use.

MOWERS, REAPERS, ETC.

Of the expensive labor-saving agricultural implements, like the mower, the reaper, and the thresher, it does not fall within our purpose to speak, further than to recommend our readers to avail themselves of the grand economies which they afford, whenever they can, by combinations with their neighbors for joint ownership of such machines, or by employing those kept for the purpose of being hired out.

PRACTICAL POINTS ON FARM MANAGEMENT

THE first requisite in all undertakings of magnitude is to "count the cost."

The importance of possessing the means of doing everything at exactly the right season can not be too highly appreciated.

Admitting that the farm is already purchased and paid for, it becomes an object to know what else is needed and at what cost, before cultivation is commenced. If the buildings and fences are what they should be, which is not often the case, little immediate outlay will be needed for them. But if not, then an estimate must be made of the intended improvements, and the necessary sum allotted for them.

Size of Farms.—The cultivator will perceive in part the advantages of moderate-sized farms for men in moderate circumstances. The great disadvantage of a superficial, skimming culture is obvious with a moment's attention. Take the corn crop as an illustration. There are a great many farmers whose yearly product per acre does not exceed an average of *twenty-five* bushels. There are other farmers who obtain *generally* not less than *sixty* bushels per acre, and often eighty to ninety-five. Now observe the difference in the profits of each. The first gets 250 bushels from *ten* acres. In doing this he has to plow ten acres, harrow ten acres, mark out ten acres, find seed for ten acres, plant, cultivate, hoe, and cut up ten acres, besides paying the interest on ten acres, worth from three to five hundred dollars. The other farmer gets 250 bushels from *four* acres at the furthest; and he only plows, plants, cultivates, and hoes, to obtain the same amount, *four acres,* which from their fine tilth, and freedom from grass and weeds, is much easier done, even for an equal surface. The same reasoning applies throughout the farm. Be sure, then, to cultivate no more than can be done in the best manner, whether it be ten, fifty, or five hundred acres.

But let me not be misunderstood. Large farms are by no means to be objected to, provided the owner has capital enough to perform all the work as well as it is now done on the best farms of small size.

Laying Out Farms.—This department is very much neglected.

Many suppose that this business is very quickly disposed of; that a very few minutes, or hours at most, will enable a man to plan the arrangement of his fields about right. But this is a great error. Even when a farm is of the simplest form, on a flat, uniform piece of ground, many things are to be borne in mind in laying it out.

In the first place we all know that the *fencing* of a moderate-sized farm costs many

hundred dollars. It is very desirable to do it well, and use at the same time as little material as possible. To do this much will depend on the shape of the fields. A certain length of fence will inclose more land in the form of a *square* than in any other practical shape. Hence fields should approach this form as nearly as possible. Again, the disposition of lanes is a matter of consequence, so as to avoid unnecessary length and fencing and at the same time occupy the least quantity of ground.

In laying out a farm with a very uneven surface or irregular shape, it would be best to draw, first, a plan adapted to smooth ground, and then vary in size and shape of the fields, the distance of the lane from the centre, its straightness, etc., according to the circumstances of the case.

Fences.—The kind of fence used, and the materials used for its construction, must depend on circumstances and localities. A good fence is always to be preferred to an imperfect one; though it will cost more, it will more than save that cost, and three times the amount in vexation besides, by keeping cattle, colts, and pigs out of fields of grain.

Gates.—Every field on the farm should be entered by a good self-shutting and self-fastening gate. Let the farmer who has *bars* instead of gates make a trial of their comparative convenience, by taking them out and replacing them without stopping as often as he does in one year on his farm, say about six hundred times, and he can not fail to be satisfied which is the cheapest for use.

Buildings.—These should be as near the centre of the farm as other considerations will admit. The buildings should not, however, be too remote from the public road, and a good dry, healthy spot should be chosen.

The barn and outbuildings should be of ample extent. The barn should have space for hay, grain, and straw. It is a matter of great convenience to have the straw for littering stables housed and close at hand, and not out of doors, under a foot of snow. There should be plenty of stables and sheds for all domestic animals.

A small, cheap, movable horsepower should belong to every farm, to be used in churning, sawing wood, driving washing machine, turning grindstone, cutting straw, and slicing roots.

There should be a large root-cellar under the barn, into which the cart may be *dumped* from the outside. One great objection to the culture of roots in this country—the difficulty of winter keeping—would then vanish.

Both barns and house cellars should be well coated, on the bottom and sides, with water-lime mortar, which is a very cheap and effectual way to exclude both water and rats.

Choice of Implements.—Of those which are much used, the very best only should be procured. A laborer who, by the use of a good hoe for one month, can do one-quarter more each day, saves, in the whole time, an entire week's labor.

Choice of Animals.—The best of all kinds should be selected, even if costing something more than others. Not "fancy" animals, but those good for use and profit. Cows should be productive of milk, and of a form adapted for beef; oxen, hardy and fast working; sheep, kept fine by never selling the best; swine, not the *largest* merely, but those fattening best on least food. A Berkshire at 200 pounds, fattened on 10 bushels of corn, is better than a "land pike" of 300, fattened on 50 bushels.

VARIOUS KINDS OF FENCES

(1.) *Stone Fence.*—Wherever there is plenty of stone, and especially where loose stones abound and must be removed before the land can be properly cultivated, stone fences are the best and most economical that can be constructed.

Where stone is not very abundant, a combination of stone and rail fence is often economically constructed. A substantial foundation of stones is laid, reaching two or two and a half feet above ground, in which posts are placed at proper distances, with two or three bar holes above the wall, for the insertion of an equal number of rails, which for convenience should be put in when the posts are set.

(2.) *The Zigzag or Worm Fence.*—In large portions of our country, where there is a superabundance of timber and economy of space is of little importance, the common zigzag or worm fence of the West and South is probably the most economical that can be erected.

(3.) *Post-and-Rail Fences.*—As timber becomes somewhat more valuable, it ceases to be economical to use it so lavishly as the worm fence requires, and the post-and-rail fence takes its place. This is, in many respects, the best of all the wooden farm fences.

The best timber for posts in the order of its durability is red cedar, yellow locust,

white oak, and chestnut, for the Northern and Middle States.

In some cases boards may be economically substituted for rails, and firmly nailed to suitably prepared posts.

(4.) *The Sunken Fence.*—The sunken fence or wall consists of a vertical excavation on one side, about five feet in depth, against which a wall is built to the surface of the ground. The opposite side is inclined at such an angle as will preserve the sod against sliding, from the effects of frost or rain, and is then turfed over.

(5.) *Iron Fences.*—Wire and other forms of iron fence are now in extensive use. Where there is a deficiency of both timber and stone, the wire fence is probably the best and most economical that can possibly be made.

No ordinary domestic animal will break through fences of considerably less than one-quarter inch wrought wire, while still larger sizes may be used with the same facility if required. The bright or hard wire is now generally used.

Another style of iron farm fence is called the "Corrugated Flat Rail Fence." It is in some respects preferable to the round rail or wire, being visible at a greater distance and less liable to sagging.

(6.) *Hurdle Fence.*—The hurdle, or light, movable fence, is formed in short panels, and firmly set in the ground by sharpened stakes at the end of each panel, and these are fastened together. This is a convenient addition to farms where heavy green crops of clover, lucern, peas, or turnips are required to be fed off in successive lots by sheep, swine, or cattle. It is variously constructed of wood or iron, and is much less expensive than might be supposed.

(7.) *Hedges.*—The live fence, almost universal in England, is still an experiment here. There have been a few successes and many failures in the cultivation of hedges. The causes of failure have been various—a wrong choice of trees, the dryness of our climate, lack of experience in planting, neglect of proper after-cultivation and pruning, etc. But the few examples of complete success which may be pointed out prove conclusively that, under proper and easily attainable conditions, live fences are perfectly practicable in this country, and in some parts of it they are doubtless economical. When well kept they are certainly very beautiful.

The soil for a hedge row must be deeply plowed or spaded, and, if poor, manured a little.

Evergreens make the handsomest hedges; and although less stout, yet by shutting out of *sight* are usually quite safe. The Norway fir is the fastest grower—the hemlock most beautiful, and the best of any for the shade of trees; the growth is, however, rather slow. It shears finely, and its *interior* is dense. The Norway fir also does well on these points.

At the South we should choose the single white Macartney rose for general cultivation; although the Cherokee rose, when properly treated, the evergreen thorn, the honey locust, the jujube, and the Spanish bayonet (*Yucca gloriosa*) all form efficient and beautiful hedges.

A really good and perfect hedge should form a rounded pyramid, branching out broadly and close to the ground, and tapering up either sharply or obtuse, as the taste of the cultivator may determine. This is a fundamental principle in all hedging, and unless it is secured at the outset by proper trimming, it can never be done afterward.

A PRACTICAL DISCUSSION OF FARM CROPS

I.—THE EDIBLE GRAINS

INDIAN CORN (*Zea Mays*).—The principal varieties of Indian corn in extensive use for field culture in the United States are the Big White, Big Yellow, Little White, Little Yellow, and Virginia Gourd Seed (yellow and white). Of each of these there are many sub-varieties. The King Philip, or Brown Corn, a very early and small-growing but productive variety, is much approved in the more northern States; and Peabody's Prolific or Tillering Corn, said to be a wonderfully productive sort, is adapted to the Southern and Middle States; but it has not yet been extensively tested. In the selection of varieties, choose for general planting those that have been *proved* in your own vicinity, as the best sort of one locality may prove inferior in another. For trial, get new sorts from a more northern latitude, especially where earliness is particularly desirable.

The best soil for corn is a rich loam, but good crops are produced, with proper manuring, on light, sandy land. A strong clay, or a poor, wet soil will not produce a good

crop. Corn is a gross feeder, and, except on very light, sandy soils, fresh, unfermented manure is best for it. Ashes may be added or applied as a top dressing, with great advantage; also the salt and lime mixture.

The after-culture of Indian corn may mostly be performed with a light plow and a good cultivator. It should be commenced soon after the plants show themselves above ground, but deep culture of every kind should be discontinued after the roots have spread through the soil, as they can not be disturbed without great injury. Hilling or heaping the earth about the plants is an absurd and injurious process, which, instead of helping to support them, as many suppose, greatly weakens the stalks, by destroying or covering up the prop-roots with which nature has supplied them.

Corn should be perfectly dried in the field, husked, and stored in an airy loft, or in a properly constructed granary or crib.

The proper selection and saving of seed is of great importance. It should be selected in the field from the earliest and largest ears of the most prolific stalks. In this way astonishing improvements in a variety may be gradually made.

Wheat (*Triticum* of species).—Botanists describe about thirty species of wheat and some hundreds of varieties. The species mainly cultivated in the United States are the Winter Wheat and the Spring Wheat, in their numerous varieties.

In your choice of varieties it is best to be governed, as in the case of Indian corn, by the experience either of yourself or others. Depend upon known and tried sorts till, by experiments on a small scale, you are satisfied that you have obtained something better.

"Wheat thrives best on a strong, clayey loam, but many light and all calcareous soils, if in a proper condition, will give a good yield. The soil should be deep, and well pulverized with the plow and the harrow. Underdraining and subsoil plowing add greatly to the amount of the crop.

"Select seed that is free from the seeds of weeds and from smut, if this be possible; but in any event it is well, previous to sowing, to wash it in a strong brine made of salt and water, taking care to skim off all light and foreign seeds. If the grain be smutty, repeat the washing in another clean brine, when it may be taken out and intimately mixed with about one-twelfth of its bulk of pulverized quicklime.

"Wheat is subject to the attack of the Hessian fly if sown too early in the fall, and again the ensuing spring, there being two annual swarms of the fly, early in May and September. When thus invaded, harrowing or rolling, by which the maggots or flies are displaced or driven off, is the only remedy of much avail. Occasionally other flies and sometimes wheat worms, commit great depredations. There is no effectual remedy known against any of these marauders, beyond rolling, brushing, and harrowing."

The grain should be cut immediately after the lowest part of the stalk becomes yellow, while the grain is yet in the dough state, and easily compressible between the thumb and finger. Repeated experiments have demonstrated that wheat cut at this time will yield more in measure, of heavier weight, and a larger quantity of sweet, white flour. If early cut, a longer time is required for curing before storing or threshing.

Spring wheat should be sown as early as the ground will admit. The best crops are raised on land that has been plowed the previous fall, and sown without additional plowing, but harrowed-in thoroughly.

Rye (*Secale Cereale*).—This plant will flourish on soils too poor or too destitute of lime for wheat. It has taken the place of wheat in many portions of the country, where repeated crops of the latter have exhausted the soil of some of the requisite elements for its growth. The best soil for it is a rich, sandy loam, but it grows freely on the lightest sandy and gravelly soils that are capable of sustaining any kind of vegetation. The directions for the preparation of soil and seed, and for cultivation, harvesting, etc., are the same as for wheat, but it is sometimes sown among standing corn and hoed in, the ground being left as level as possible. As soon as the corn is matured it is cut up by the roots and removed to the sides of the field, when the ground is thoroughly rolled.

The Oat (*Avena Sativa*).—This grain will grow on any soil, and in almost any climate. It is affected less by disease and has fewer insect enemies than most of the cereals. The wire worm, however, occasionally proves destructive to it, when sown on fresh sod. The remedy in this case is to turn over the sod late in the fall, just before the severe winter frosts.

There are many varieties and sub-varieties of the oat.

The heaviest oat cultivated in the United States is the Imperial; and it is preferred by many to all others. It is bright and plump, and yields a large proportion of nu-

tritive matter. It has proved very productive in the Northern and Middle States. But the variety most cultivated is the common White Oat, which is hardy and a good bearer.

The only oat that will mature with certainty in the Southern States is the Egyptian. It is sound, hardy, and moderately productive. It is sown in autumn. On most soils rolling is beneficial.

BARLEY (*Hordeum*).—In Europe this grain ranks next to wheat in importance; but it is much less extensively cultivated in the United States.

A loam of medium consistency, between light and heavy, is best for it. Barnyard manures must never be applied directly to this grain. Steeping the seed twenty-four hours in a week solution of saltpetre is beneficial. The roller is sometimes applied to the field, when the plants are two or three inches in height, with great resultant benefit.

It is of great importance to harvest barley at the proper time.

RICE (*Oryza Sativa*).—Rice probably affords food for more human beings than any other plant.

The varieties of rice most grown in South Carolina and Georgia, which have hitherto been the greatest rice-producing States of the Union, are the Gold-seed rice, the Guinea, the Common White, and the White-bearded. There are several other varieties, but generally inferior to the foregoing. The best are produced by careful cultivation on soils suited to this grain, and by a careful selection of seed.

The method of cultivation pursued on the rice lands of the lower Mississippi, as detailed by Dr. Cartwright, a practical planter, is as follows:

"The seed is sown broadcast about as thick as wheat, and harrowed in with a light harrow, having many teeth; the ground being first well plowed and prepared by ditches and embankments for inundation. It is generally sown in March, and immediately after sowing, the water is let on, so as barely to overflow the ground. The water is withdrawn on the second, third, or fourth day, or as soon as the grain begins to swell. The rice very soon after comes up and grows finely. When it has attained about three inches in height, the water is again let on, the top leaves being left a little above the water. Complete immersion would kill the plant. A fortnight previous to harvest the water is drawn off to give the stalks strength, and to dry the ground for the convenience of the reapers."

BUCKWHEAT (*Polygonum Fagopyrum.*)—Buckwheat is extensively cultivated in the United States, as it affords a flour which is much esteemed as an article of food. It will grow with considerable luxuriance on the poorest land. When intended for seed it should be sown sufficiently early to allow the kernel to become perfectly ripe—say from the middle of June to the first of July.

Buckwheat is often used for plowing under as a green manure. This can be done where the land is too poor to produce clover for that purpose. When in flower, it should be first rolled, and then plowed in.

MILLET (*Panicum*).—The species generally cultivated for the seed is the *P. milliaceum.* As a forage crop, the German millet (*P. Germanicum*) is preferable, and is coming into extensive use, especially in the West.

II.—HOW TO SHOCK GRAIN

Many a valuable harvest may be preserved from ruin by taking heed to the following hints:

(1.) Grain should be firmly bound in smaller sheaves than are almost universally used. Loosely bound sheaves can not be well shocked. They also admit more rain than tightly bound ones.

(2.) Two men can shock better and more advantageously than one.

(3.) Let the shocker always take two sheaves at a time, holding them with his elbow against his side, bringing the heads together with hands well spread upon them. Lift them as high as possible, bringing them with force, in as nearly a perpendicular position as can be, to the ground. Never make the second *thrust,* if the sheaves stand erect, for every one after the first, by breaking the butts, makes the matter worse.

(4.) Then let two persons bring down *two sheaves each at the same time,* as before described, being extremely careful to keep them perpendicular. The form of shock at this period may be represented thus:

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(5.) As lastly stated, two more each, thus:

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The reader will perceive we now have ten sheaves, forming a circle as nearly as can be.

(6.) While one man presses the head of the shock firmly together, let the other *break,* not bend, the *two* cap sheaves,

and place them on, well spreading heads and butts.

The main points are, to have grain *well bound*, sheaves made to stand in an *erect position*, and then to put cap sheaves on *firmly*, and every gust of wind will not demolish your work.

Grain is usually shocked in this manner: One sheaf is made to stand alone, another is *leaned* against it, and another, sometimes at an angle of forty-five degrees, "to make them stand up," until a sufficient number is thought to be *leaned up*

Now, the probability is, that there is but *one* sheaf in the whole shock that has its centre of gravity within its base; as a matter of course, each depends on some other to hold it up. Consequently they twist; and if the shock does not fall down before the hands get the next one up, it most certainly will during the first rain, just when the perpendicular position is most necessary.

III.—LEGUMINOUS VEGETABLES

The Kidney Bean (*Phaseolus Vulgaris*).—The bush or dwarf kidney bean is frequently cultivated as a field crop. There are many sorts that may be profitably used for this purpose, but the Small White is generally preferred, as it is very polific, quite hardy, will grow in light, poor soil, and is more delicately flavored than the colored varieties. The Long White garden bean is also good.

The bean succeeds best on a light, warm, and moderately fertile soil. A strong soil, or too much manure, induces a tendency to run to vine, without a corresponding quantity of fruit.

Plant either in hills or in drills. If you have a sower, or drill for putting them in, the latter is the best mode. The drills may be from two to three feet apart, the hills from eighteen inches to two feet each way. From five to eight plants are enough for a hill. They must be kept clear from weeds by the use of the hoe or cultivator; but should be earthed up very slightly, if at all. The first of June is sufficiently early to plant them. They are sometimes planted with corn, putting three or four beans in each hill. This may be done either at the time of planting the corn, or at the first hoeing.

The Pea (*Pisum Sativum*).—The Marrowfat and Small Yellow peas are the sorts generally used for field culture. The Marrowfat is the richer and better pea, and is to be preferred for good soils. The Small Yellow thrives on poorer soils, and is therefore, in some cases, more profitably cultivated. In some parts of the South a very prolific bush pea is cultivated and much esteemed for the table, both green and dry.

Prepare the ground as for any other spring crop, by plowing and harrowing, and sow broadcast, at the rate of two or two and a half bushels to the acre. Cover them with the harrow or the cultivator, the latter implement being preferable, and smooth the ground by the use of the roller.

The great enemy of the pea is the pea-weevil or pea-bug, which is too well known to require description. As a remedy, some recommend keeping the seed in tight vessels over one year. This plan, if universally adopted, would probably lead to the total extermination of this destructive insect; but as this is not likely to be the case, the only practicable way to avoid its ravages is by late sowing.

The Peanut (*Arachis Hypogæa*).—This is a legume bearing its pods under the surface of the ground. It was originally brought from Africa.

A North Carolina planter thus describes the mode of cultivation: "As soon as the frost is out of the ground, the land is broken up, and about the middle of April laid off with the plow thirty-three inches each way; two or three peas are then dropped in the crosses thus made. The plants are kept clean with hoes and plows until the vines cover the ground; but no dirt is put on the vines. In October they are dug with a rake or plow. Hogs are then turned into the field, and they soon fatten upon the peas left upon the ground. When the vines are left upon the land for the hogs to feed upon, there is no crop that improves the land so much."

IV.—ESCULENT ROOTS

The Potato (*Solanum Tuberosum*).—In reference to the choice of varieties for planting, the best advice we can give will be simply a repetition of our recommendations in respect to several other plants: Choose such as have been well tested by yourself or others, and found adapted to the soil and purposes for which they are to be cultivated. Try your experiments with new sorts, on a small scale, and with close observation of the results. Experiment, also, if leisure serve, in the production of new varieties from the seeds found in the balls.

A fair crop of potatoes may be produced on almost any soil, properly manured and

prepared and well cultivated, but a rich loam, of medium humidity, is best. If fresh or unfermented manures be used, they should be spread on the land, and plowed under, and not scattered in the drills or hills, as they are apt to injure the flavor of the potatoes. Lime, crushed bones, gypsum, salt, and ashes are excellent special manures for the potato. The soil should be made loose and mellow before planting.

The Sweet Potato (*Convolvulus Batatas*).—This is *the* potato of the South, and is much cultivated in the Middle and Western States. In its perfection, as it grows in South Carolina and the other extreme Southern States, it is the best of all the esculent roots.

The varieties most cultivated are the Small Spanish, long, purplish color, grows in clusters, very productive, and of good quality; Brimstone, sulphur-colored, long, large, and excellent; Red Bermuda, the best early potato; Common Yam, root oblong and large, the best keeper, and very productive.

A dry, loamy soil, inclining to sand, is best for the sweet potato. The manure should be plowed in, and the ground well pulverized. A top-dressing of wood ashes is very beneficial.

As soon as the tops are dead or touched by the frost, the crop should be gathered.

Sweet potatoes are difficult to keep.

The Turnip (*Brassica Repa*).—The varieties of the turnip are numerous. The flat English turnip has been longest in cultivation, and still holds its place among most farmers as a field crop. It thrives best on new land and freshly turned sod, but will grow wherever Indian corn can be raised.

English turnips are often sowed among Indian corn at the last hoeing, producing, in many cases, a fair crop.

The Ruta-Baga, or Swedish, turnip is a far more valuable root than the English, but requires a little more attention in cultivation. It will grow on a heavier soil, yield as good a crop, furnish a more nutritive root, and keep longer.

The turnip is exposed to numerous depredators, of which the turnip flea-beetle is the most inveterate. It attacks the plant as soon as the first leaves expand, and often destroys two or three successive sowings. When the fly or bug is discovered, the application of lime, ashes, or soot, or all combined, should be made upon the leaves, while the dew or a slight moisture is on them.

Harvesting should be deferred till the approach of severe frosts, and at the South the crop may remain in the ground till wanted in the winter.

The Purple-Topped Swede, Skirving's Swede, and Ashcroft's Swede are approved varieties.

The Carrot (*Daucus Carota*).—The varieties mostly used for field culture are the Altringham, the Orange, and the White Belgian. The last-named is very productive, and, growing high out of ground, is more easily harvested than the other sorts; but, on the other hand, it is considered below the others in nutritive value.

It is very important to have both the soil and the manure for carrots free from the seeds of weeds and grasses; the plants in the early stages of their growth are small and feeble, which makes it a slow and expensive process to eradicate the weeds, if abundant. Well manured sandy, or light, loamy soils are best adapted to the carrot crop. The ground should be deeply worked, and brought to a fine tilth before sowing the seed.

The Parsnip (*Pastinaca Sativa*).—The parsnip is one of the best of all our table vegetables, and is also excellent for cattle, sheep, and swine. The leaves of both parsnips and carrots are good for cattle, either green or dried.

The Beet (*Beta Vulgaris*).—The varieties most in use for field culture are the Sugar beet and the Mangold-Wurzel, of both of which there are several sub-varieties.

Beets do well in any soil of sufficient depth and fertility, but they are perhaps most partial to a strong loam. If well tilled, they will produce large crops on a tenacious clay. We have raised at the rate of 800 bushels per acre, on a stiff clay, which had been well supplied with unfermented manure. The soil can not be made too rich; and for such as are adhesive, fresh or unfermented manures are much the best.

The culture is similar to that of carrots and parsnips.

V.—THE GRASSES

The grasses cultivated for the food of animals are too numerous to admit of a description in such a work as this.

We will speak briefly of a few of the leading species cultivated among us, noting some of their peculiar excellences and adaptations.

TIMOTHY (*Phleum Pratense*).—Allen says: "For cultivation in the northern portion of the United States, I am inclined to place the timothy first in the list of the grasses. It is indigenous to this country, and flourishes in all soils except such as are wet, too light, dry, or sandy; and it is found in perfection on the rich clays and clay loams which lie between 38° and 44° north latitude. It is a perennial, easy of cultivation, hardy and of luxuriant growth, and on its favorite soil yields from one and a half to two tons of hay per acre at one cutting."

It may be sown either in August or September with the winter grains, or in the spring. "Twelve quarts of seed per acre on a fine mellow tilth are sufficient; and twice this quantity on a stiff clay." This is the Herds grass of New England.

THE SMOOTH-STALKED MEADOW GRASS (*Pea Pratensis*).—This is one of the best of grasses, both for hay and for pasture. It is a native species, and is found almost everywhere, but does not grow in its greatest perfection north of the valley of the Ohio. It is seen in all its glory on the fertile soils of Kentucky and Tennessee. Every animal that eats grass is fond of it.

The Roughish Meadow grass (*P. trivialis*) has the appearance of the smooth variety, but is rough to the touch, and prefers moist situations and clayey soils. This, also, is an excellent grass.

RED TOP (*Agrostis Vulgaris*).—A hardy and luxuriant species, much relished by cattle, but possessing only a moderate nutritive value. It is much cultivated in some portions of New England and elsewhere; but where better grasses will grow, this should be rejected. It is sometimes called Foul Meadow and Bent Grass.

TALL OAT GRASS (*Avena Elatior*).—An early and luxuriant grass, flourishing in a loamy or clayey soil, and making good hay. It grows to the height of four or five feet on good soils. It is well suited to pasture.

THE FESCUE GRASSES (*Festuca* of species).—The Tall Fescue grass (*F. elatior*), according to some experiments made in England, yields more nutritive matter per acre, when cut in flower, than any other grass cut either in flower or seed. It is an American grass, but has found less favor at home than abroad.

The Meadow Fescue (*F. pratensis*); the Spiked Fescue (*F. loleacea*); the Purple Fescue (*F. rubra*); and the Floating Fescue (*F. fluitans*), are all indigenous grasses of fine qualities and great value.

ORCHARD GRASS (*Dactylis Glomerata*).—The Orchard or Cock's Foot grass is excellent for shaded situations. It should be cut before it is ripe, and will furnish three or four crops a year.

THE EGYPTIAN GRASS (*Sorghum Halpense*).—A cane-like grass which grows in profusion in some of the Southern States. It is a superior stock-sustaining plant; but as it is difficult to remove when once imbedded in the soil, its introduction into cultivated fields is considered a great evil.

GERMAN MILLET (*Panicum Germanicum*).—This plant, known at the West as Hungarian grass, seems to have been introduced into Iowa by a Hungarian immigrant, and to have spread thence to other parts of the country. It had, however, been previously cultivated in small quantities under its proper name of German Millet. As a forage crop, for the West at least, its value seems to be well proved. It has been less extensively tested at the East.

THE CLOVERS (*Trifolium* of species).—The Common Red clover (*T. pratense*) is a hardy and easily cultivated species, of which there are several varieties. It grows luxuriantly on every well-drained soil of sufficient strength to afford it nutriment.

Clover should be cut after having fully blossomed and assumed a brownish hue.

Southern Clover (*T. medium*) is a smaller species than the common red, and matures earlier. It succeeds better on a light soil than the latter, and should be sown more thickly.

The White or Creeping clover (*T. repens*), of which there are several varieties, is a self-propagating plant, and adds greatly to the richness of many of our pastures, especially on clayey soils. It is very nutritious, and cattle, sheep, and horses are all fond of it.

Dr. Darlington, of Pennsylvania, gives the following as the species of grasses most valuable in our meadows and pastures, naming them in the order of their excellence:

1. Meadow or green grass (*Poa pratensis*). 2. Timothy (*Phleum pratense*). 3. Orchard grass (*Dactylis glomerata*). 4. Meadow Fescue (*Festuca pratensis*). 5. Blue grass (*Poa compressa*). 6. Ray grass (*Lolium perenne*). 7. Red top (*Agrostis vulgaris*). 8. Sweet-scented vernal grass (*Anthoxanthum odoratum*).

BROOM CORN (*Sorghum Saccharatum*).—Broom corn requires similar soil to Indian

corn. A green sward turned over late in the fall is best. Well-rotted horse or sheep manure and wood ashes may be liberally scattered in the drills or hills. A situation not subject to early or late frosts should be chosen. Clayey lands are not suitable.

Flax (*Linum Usitatissimum*).—A deep, rich loam or alluvial soil is best for flax. The proper fertility should be secured by a surplus of manure applied to a previous crop, as fresh manures are injurious to it.

Hemp (*Cannabis Sativa*).—This is a plant of the nettle tribe, and came originally from India. The Russians are at present its chief cultivators; but in our Western States, and especially in Kentucky, it is beginning to be widely raised.

A rich loam or vegetable mould suits the hemp plant. The ground should be carefully prepared by plowing and harrowing till it is perfectly pulverized, smooth, and even. The seeds are sown broadcast at the rate of a bushel and a half to the acre, and plowed or harrowed in. Plowing is best on ground liable to bake. In Kentucky, they sow any time from the first of April to the tenth of May. It is desirable to sow just before a rain.

The Hop (*Humulus Lupulus*).—The hop is found growing spontaneously on the banks of rivers and brooks in various parts of this country.

The best soil for the cultivation of hops is a sandy loam, rather low and moist, but they will grow on soils very different from this. New lands are to be preferred.

If the land has been long in use, it should be dressed with a compost of alkaline manures, or, what is nearly equivalent, with fresh barnyard manures, on a previously well-hoed crop, and made perfectly free from all weeds, and deeply plowed and harrowed.

After gathering in the fall, the hops should be hilled or covered with compost, and all the vines removed. The following spring, when the ground is dry, the surface is scraped from the hill and additional compost is added, when a plow is run on four sides, as near as possible without injury to the plants. All the running roots are laid bare and cut with a sharp knife within two or three inches of the main root, and the latter are trimmed if spreading too far. It is well to break or twist down the first shoots, and allow those which succeed to run, as they are likely to be stronger and more productive. Cutting should be avoided, unless on a sunny day, as the profuse bleeding injures them. The poles will keep much longer if laid away under cover till again wanted the following spring. Drying may be done by spreading the hops thinly in the shade, and stirring them often enough to prevent heating; but when there is a large quantity they can be safely cured only in a kiln.

HINTS ON THE CULTIVATION OF FRUIT

COST

THE cost of first planting will vary widely in different localities—depending on the condition of the ground, the quality of the soil, prices of trees, price of labor, etc. An approximate calculation may be made, however, by estimating the cost of preparing the ground and planting the trees, at an amount equal to the cost of the trees in the nursery; and, when ditching and underdraining is necessary, at double that amount. The following rule laid down by Thomas Gregg in his admirable work on fruit culture should be inflexibly observed in all cases: *Never slight the work, nor plant an inferior tree, because it is cheaper to do so!* Work half done is very poor economy in planting an orchard, as well as in most other things; and a tree costing only half price in the nursery may turn out to be a very dear one in the end. The very best varieties (and these are not always the most costly), as well as the very best trees, are those from which you must expect to realize the most profit.

ESTIMATE FOR THREE ACRES

The following estimate will answer for an orchard of three acres of ground, with such variations as circumstances may require. [The number of trees will vary somewhat as the shape of the ground is varied; the calculation is based on a plat which is twenty-four rods long by twenty wide.]

Eighty apple trees, thirty-three feet apart, covering two acres.

Seventy peach-trees, sixteen and a half feet apart, set around three sides of the whole.

There will then be left in front one acre, which may be divided into two equal plats

of 132 by 166 feet. These may be filled as follows:

In No. 1.—Twenty standard pears, thirty-three feet apart, in continuation of the apple rows.

Thirty-two dwarf pears, in the same rows, seven feet apart and thirteen feet from the standards. And—

Twenty-seven pyramid and dwarf plums, quinces, cherries, etc., in the alternate rows, sixteen and a half feet apart.

In No. 2.—Such number of almonds, apricots, grapes, nectarines, gooseberries, currants, raspberries, blackberries, and strawberries as fancy may dictate and as will stock it properly.

The above estimate will constitute an orchard of about 250 orchard trees—standard and dwarf—and perhaps as many more of the garden or brush fruits.

DISTANCES

Every planter has his own opinion regarding the distance which trees should be planted from each other. Besides, some kinds of soils and localities require greater distance than others; and some varieties will bear to stand closer than other varieties of the same fruit. A good rule is that, when full grown, the tops should not be nearer to each other than one-third their diameter. An apple-tree, for example, when fully grown, will spread, on an average, to a distance of twenty-five feet; the rule will give thirty-three feet as the proper distance apart. Peaches seldom spread, or should not, if properly pruned, more than twelve to fifteen feet; the rule gives sixteen to twenty feet as the distance to plant. In planting an orchard of apples, with plenty of ground, thirty-three feet is probably the safest distance; yet, if ground is an object, they will do at twenty-five feet. Apples may be planted a little wider—say forty feet—and rows of peach-trees planted both ways between: as the peach, not being so long-lived, will die out before the apple has attained to a large growth.

When the saving of ground is an important consideration, and none but standard trees are to be planted, more space may be obtained by planting in rows, according to the following diagram:



Smaller trees may be set closely in rows, as represented in the figure below:



This last method is recommended for village plats, where it is desirable to combine the raising of vegetables with that of fruit; as the spaces between the rows may be appropriated to any kind of root crop, with decided advantage to the trees.

The following table of distances for the various kinds of fruit, condensed from Thomas's "Fruit Culturist," seems to have been acquiesced in by most fruit-growers:

Apples.—	
For large trees	25 to 40 feet
For pyramids and dwarfs	6 to 8 "
Pears.—	
Large trees on pear stocks	20 "
Pyramids on pear stocks	8 to 10 "
Pyramids on quince stocks	6 "
Dwarf standards on quince	8 "
Peaches.—	
Full growth	20 "
Shortened in	12 to 15 "
Cherries.—	
Common standards	20 "
Pyramids on common stocks (Dukes and Morellos require less).	10 "
Plums.—	
Standards	15 "
Pyramids	6 to 8 "
Apricots	15 to 20 "
Quinces	6 to 8 "
Grapes.—	
On 8-ft. trellis	25 "
On 12-ft. trellis	16 "
Trimmed to stakes	4 to 6 "
Gooseberries and Currants	4 to 5 "
Raspberries and Blackberries	4 "

For the above distances, the following is the number of trees required for an acre:

40	feet	apart	27	trees	
33	"	"	40	"	
25	"	"	69	"	
20	"	"	108	"	
15	"	"	193	"	
12	"	"	302	"	
10	"	"	435	"	
8	"	"	680	"	
6	"	"	1,208	"	
4	"	"	2,720	"	

LOCATION

Much has been said and written concerning the location of orchards. Situation and aspect doubtless have their effects, yet no one should neglect to plant merely because he can not give his trees such an aspect as he may desire. Trees in favorable situations will undoubtedly produce more good crops than those less fortunately situated; yet many seasons occur when the causes of the difference do not arise, and trees in any exposure will produce abundantly. To this general rule there can be very few exceptions, namely—*Elevated situations are better than lowlands, and the brows and sides of hills are to be chosen in preference to the valleys.* Numerous proofs have been adduced to show that the peach might be successfully grown much further north than it usually is, if the most elevated positions were chosen instead of the warm valleys. So, further south, frequent severe frosts cut off the crops on the low grounds, while those on the more elevated and exposed situations are not affected.

The old rule was to choose a southern or southeastern exposure. A northern exposure is now very generally preferred. This is because the action of the warm sun, in a southern exposure, will too soon thaw away the frost about the roots, and cause the buds to swell—leaving them exposed to alernations of frost and thaw. In the West, the rolling prairies near the woodland, the hazel ruffs that skirt the prairie and wood, and the richest portions of the timbered bluffs or highlands that overlook the rivers are regarded as the best locations. The best bearing orchards are those on the bluff overlooking the Mississippi at the Lower Rapids.

SOIL

Fruit trees, like corn and cabbages, will grow on almost any kind of soil; yet some soils are more suited to their natures than others. They require a soil strong enough to give the tree a vigorous growth, and the better and more vigorous the growth of the tree, the better will be the character of the fruit. As a general thing, any soil that will produce a good crop of corn will be good for fruit-trees. A strictly alluvial soil, however, is not to be recommended; as, while it will produce a rank growth of wood, it will not make so hardy or fruitful a tree; nor will the quality of the fruit be equal to that grown on a less fertile soil. A calcareous soil is the best adapted to most kinds of fruit; yet in other than limestone regions a gravelly or sandy loam will be found to answer a good purpose. Stiff, clayey soils are not promotive of a good growth; yet they can be rendered available by a proper incorporation of sand, manure, and vegetable mould. Most soils—even those in the limestone region—require an addition of more or less lime and potash, as these ingredients enter largely into the composition of most fruits.

PREPARATION OF THE GROUND

Not one in a hundred of those who plant trees bestows the necessary care and attention on the preparation of the ground. A very common mode is to dig a hole about a foot wide and five or six inches deep, stick in the tree—bending the roots or cutting them off to bring them within the proper compass—shovel in a few spadefuls of dirt or sod, tread it down with the foot, and the job is done! If the tree grows, well; if not, the planter has only been unlucky, and all the neighbors conclude not to plant—*it is so hard to make trees grow!* Is it any wonder that three out of every four trees taken from the nursery die without having reached the stage of fruit-bearing?

In the first place, the soil must be dry before planting. If not so naturally, it must be made so by deep plowing, and, if this will not suffice, then by underdraining. A clay subsoil should be underdrained to the depth of three feet; but any soil not very retentive of water may be sufficiently drained by the use of a subsoil plow and a strong team. With good underdraining and a proper admixture of manure, ashes, sand, and loam, the toughest clay soils may be reduced to a proper condition for fruit-trees. All soils that are sufficiently porous to drain well should be first prepared with the plow, harrow, and subsoiler; and then the holes for the trees should be made only of proper size and depth to admit the roots in their natural position, and at two or three inches greater depth than they stood in the nursery. Deep holes in a hard and tenacious subsoil will injure the trees by retaining too much water. Such soils should be avoided for a fruit orchard; or if used, should first be properly underdrained. Many young trees die from the effects of standing in deep holes, prepared for them at great expense.

Previous to planting, the soil should be enriched with well-rotted barnyard manure, thoroughly intermixed and pulverized by the harrow. If planting is to be done in the spring, the plowing should have been

gone through with the fall previous, and then thoroughly stirred once more just before planting. When the whole field is thoroughly prepared by the plow, it can be cultivated to some useful crop, and the trees will be more likely to receive the necessary tillage than they would if standing in the field alone.

MANURING

It is a quite common experience that the quality of fruit in orchards will, after a few years, gradually decline, yielding only small and imperfect specimens. Some varieties will show this decline much sooner than others. Negligence in regard to manuring is generally the cause of this deterioration. The application of barnyard manure will cure the evil, though, with some fruits, other ingredients are very valuable. Ashes are a good fertilizer for most fruits, and are worth more to the fruit-grower as such than for any other purpose. In the peach orchard there is little danger of getting too much. A free use of lime on some soils is very beneficial, and in many cases salt may be used to advantage. This latter has been strongly recommended as a preventive to blight in the pear.

TRANSPLANTING

LAYING OFF THE GROUND

The best way to lay off the ground, after it has been fully prepared and the distances decided upon, is to measure along the sides and ends, setting a stake at the proper distances, and then driving small stakes, say one foot high, at all the points where the lines thus indicated intersect each other. After the ground is staked, commence digging the holes—and this should be completed before the trees are removed from the nursery.

SEASON FOR TRANSPLANTING

The proper season for transplanting a tree is any time between the falling of the leaves in autumn and the swelling of the buds in spring; and, in the case of a hardy tree, as the apple, it probably makes but little difference whether it be done before the winter or after it. With other trees it is different; the less hardy ones, with diminished strength, can not so easily withstand the severe frosts and piercing nor'westers of that season. Hence they should be transplanted only in the spring. Apples may be removed either in November or April, provided it be done well, with probably about equal success.

SETTING OUT TREES

It requires three men, or two men and a boy, to set out trees as it should be done. Before inserting the roots into the hole prepared to receive them, they should first be dipped into mud made of the rich surface mould, to cause the earth to adhere to all their parts. This done, place the tree in its proper position in the hole, shovel in a small quantity of the finely pulverized mould, and then give it a gentle shaking suddenly up and down, in order to settle the dirt closely about the roots—one person to hold the tree in proper position, while another shovels in the earth. When a sufficient quantity of the earth has been placed upon the roots to bring it level with the surface of the ground, tread it down gently with the foot, and then add more, rounding it to a slight mound, with the stem of the tree for a centre. The tree should be placed in the hole so as to allow it to stand about as deep, when the earth becomes settled around it, as it stood in the nursery.

It is recommended by some to plant the tree in the orchard in the same relative position to the points of the compass that it occupied in the nursery. This may be beneficial; at any rate, it can do no harm, and it is quite an easy matter to mark the tree before it is lifted, so as to indicate its position.

If the planting be done in autumn, there should be a mound of earth ten inches to a foot high and three feet in diameter raised around the tree to steady it and protect its roots from frost and the bark from mice. When the ground becomes well settled in the spring, the mound should be removed.

TRIMMING

Before setting out, each tree should undergo a proper degree of trimming. This requires considerable judgment. As the branches and roots of a tree depend upon each other for support, it will readily be understood that neither should be overtasked. In removing it from the nursery, all the small fibrous roots, and sometimes many of the larger, are lost; hence the top must be trimmed to correspond. To do this properly, all the leading shoots should be shortened back one-half or two-thirds of the current year's growth; and, if the roots have been much injured, the leading branches should be headed back still more.

TAKING FROM THE NURSERY

Trees should be injured as little as possible in removing them from the nursery.

Taking them from the row, and tying in such a manner as to be easily transported, is properly the nurseryman's business; yet it is always best to keep a watchful eye to the work. Especial care should be taken that the roots are not broken or bruised, or cut away by the spade in taking them from the ground; and when any of the roots do become injured, they should be nicely cut off with a sharp knife. As soon as dug, the trees should be carefully arranged in convenient bunches, as much damp earth as possible placed about their roots, and then closely enveloped in some coarse sacking, or other suitable thing, and firmly tied with strong cord. If they are to be re-set at but a short distance from the nursery, these precautions are unnecessary, though, if they are to be carried any considerable distance, too much care can not be used in this respect. In all cases the roots should be carefully secured against exposure to the air and sun.

If from any cause the trees are not to be immediately planted, they should be placed in the ground, root and stock, by digging a trench and shovelling loose dirt upon them, to a depth sufficient to exclude the air. The weather will not always permit of immediate replanting, but it should in no case be delayed longer than is absolutely necessary. This covering should be done in the orchard or garden, and the trees should be removed from the trench one by one as they are planted.

SELECTION OF TREES

There is a great diversity of opinion in regard to the proper size of a tree for transplanting, though the best informed and most experienced planters now prefer a two-year-old tree rather than one of a larger size. In thrifty, well-tilled nurseries, trees of that age average about five feet high; and such a tree can be more easily handled, and is also in a better condition to sustain the violence done to its nature by transplanting, and better able to recover from it, than those of an older and larger growth. Care should also be taken to select trees of well-branched and well-formed heads, and of as near the same size, vigor, and general condition as possible.

AFTER-CULTURE

PLOWING AND HOEING

One of the most common errors among the people in regard to fruit-growing is that pertaining to after-culture. Many suppose that all that is necessary to get good fruit is to set the tree in the ground, right end downward, to be sure, and nature will do the rest. This is a most fatal error—nothing can be more unreasonable. It is as absolutely necessary that the tree which you have planted should receive culture and care afterward as that the corn which rustles in the breeze should be plowed, hoed, and harrowed to make it yield its golden harvest. Trees, as well as vegetables, must have food and drink. It is by culture that they obtain them.

Hence, in the orchard, the growing of some crop is very desirable. Roots are perhaps the best of all. Potatoes, beets, beans, carrots, parsnips, onions—all require thorough culture, and do not shade the trees; while Indian corn, clover, grass, and all the cereal grains should be rigidly excluded.

PRUNING

In the matter of pruning we find there is a great diversity of opinion among experienced fruit-growers. Some advise a free use of the knife; others prune but little, or none at all. The first are doubtless right, as regards some sorts of trees; while, in regard to other varieties, the second class are correct. And the point must be settled between them by considering the objects sought to be attained by pruning.

To our mind there are four objects to be had in view in pruning a fruit-tree. These are:

(1.) To relieve it of its dead and decaying branches.

(2.) To promote the growth of the tree.

(3.) To encourage the production, and increase the size and quality of the fruit.

(4.) To change its shape.

Now, the above being *all* the objects for which a tree ought to be pruned (except as heretofore stated, under the head of "Trimming," to preserve an equilibrium between roots and branches in transplanting), it is evident that, while a permanent vigor and productiveness are maintained without it, the less pruning the better. Many planters insist that a tree should never be pruned except for the first of these objects; because, as they allege, if a tree be faithfully kept free from all dead and decaying wood, its growth and productiveness will both be promoted. This is doubtless true to some extent with some sorts of fruit, and, unless some peculiar form is desired, it is better to do but little other pruning. Yet withal it is sometimes necessary to prune more

freely. Some varieties of the apple, for instance, will grow, if left alone, to too thick a head, and require thinning out; others grow so straggling that it is frequently necessary to cut away drooping or crooked and deformed branches, to give the tree some symmetry of appearance. After the first object is attained, the apple, the pear, and the cherry, as standards, require little more, except in the cases last alluded to. Other trees require much more, which will be treated of in the proper place.

PROTECTION

All orchards and fruit gardens, whether of old or young trees, should be carefully protected against the depredations of cattle or other animals. Good fences to secure them are indispensable, as it is utter folly to expend time and money in planting and rearing a fine orchard, and then allow animals to disfigure, maim, and destroy the trees. Cattle, horses, or sheep should never be allowed to run in orchards; nor should swine be admitted except at intervals of very short periods, in order that they may have time only to eat up the fallen fruit, and not to bark the trees or root up the ground.

In some sections birds are great depredators upon fruit, but, as a general thing, they do more good in devouring the insects than harm in consuming the fruit. If they become too numerous, they can be frightened away with guns.

MULCHING

This is simply the process of distributing some proper material around the root of each tree to retain the moisture. When not thus protected, the ground will frequently bake and greatly retard the growth of the tree. Any coarse litter, straw, or forest leaves will be suitable for mulching. It should be used plentifully—spread on to a depth of at least six inches. When properly mulched, trees will retain moisture about their roots, and make a vigorous growth, through the dry and sultry summer months, while others not protected in this way cease to grow altogether, and in many cases wither and die.

HINTS ON THE VINE AND ITS CULTIVATION

AS vine culture is so rapidly developing into a source of national wealth, the following instructions will be found of considerable value.

PROPAGATION

The grape is easily grown from cuttings —some sorts, however, much more readily than others. Those that are not so easily produced in this way are usually grown in the hot-house or hot-beds, bottom heat being required for the production of roots. This method we shall leave to those who are prepared for it.

For outdoor growth, the cuttings should be made late in the fall, or during the winter, or in the early spring. They should be cut from well-ripened wood of the new growth, and should be made about a foot in length, including two eyes, one near each end; if the wood is short-jointed, more eyes may be used, but in no case should a cutting be used with less than two. When cut, they should be tied in bunches of fifty, with the butts all one way, and should be protected from the weather until time for planting. The safest plan to do this is to bury in the ground in a well-drained soil, below the reach of frost. Or they may be packed in very slightly moistened sawdust or sand, in boxes, in a dry cellar.

In the spring, when the weather becomes sufficiently settled, they may be taken up and planted in good garden soil, previously well prepared. In planting, make a trench with the plow, or spade, ten inches deep; place the cuttings in the trench at a slight angle, and from eight to twelve inches apart, close against the side and with the top-bud just even with the surface. Then fill in a few inches of earth at the bottom, and press tightly with the foot, continuing the process with less pressure to the top. Level and smooth, and the work is done.

In a favorable season and with free-growing sorts, nineteen-twentieths of them will grow, and with proper tillage will become good plants. The only cultivation necessary will be to keep the weeds down with the hoe, and the ground mellow and moist. If not intended for sale, or transplanting the next season, they may remain another year. Otherwise they should be taken up in the fall, and stored in cellar during winter, packed in earth or sand.

In transplanting, the tops should be cut

back to two buds, and the roots shortened in to fifteen or twenty inches.

PREPARATION OF THE SOIL

Much has been said and written about preparation of the soil for grapes that is calculated to mislead the planter. Some have urged the entire trenching of the ground to a depth of three to five feet, with heavy manuring; others require the digging of deep holes, four by four feet, and filling in with manure and other enriching material; while a third and more reasonable class would only subsoil and drain, in addition to good depth of culture. In all soils suited to the growth of a good crop of corn or potatoes, grapes will flourish, and the plow, harrow, and subsoiler are the tools necessary for their preparation.

If new ground is used, the stumps and roots should be carefully grubbed out, as they will be much in the way while planting and in after-cultivation, and can be easier taken out before than after planting.

The timbered lands of our bluffs are more suited to grapes than the richer and heavier soils of the Western prairies, or the alluvial soils of the river bottoms. Thin soils, with proper cultivation, will produce grapes of a richer and better quality than others, though the size may not be so great, or the growth of wood so abundant.

TRANSPLANTING

may be safely done in spring or fall, according to latitude. In northern locations, spring planting is preferable. Southward, fall is preferred. No certain line of division can be fixed; but we should say that, as a rule, all south of the latitude of Philadelphia, Columbus in Ohio, and Quincy in Illinois, may most safely plant in the fall, while north of those points it is better to plant in the spring.

In fall planting there is this advantage—the young plants can be taken directly from the nursery bed and planted, without remaining out of ground for any length of time. Whereas, if planting be delayed till spring, the vines must be taken care of for the winter—as heretofore noted—with more or less loss. In any case, it is important that the roots shall not be exposed to the weather, or allowed to become dry. In removing from the nursery row, they should be securely packed in damp moss, straw, hay, or litter of some sort, until they are finally disposed of by planting or packing for the winter.

After frost, and the leaves have begun to drop, the fall planting may commence. In spring it should be done as soon as the weather becomes settled and the soil in good condition. The last of October, and through November, will do for fall planting; in spring, the 1st of May.

Fall planting is preferable on this account also—that the soil will become packed to the roots during winter, the new growth of roots will be ready to start, and the plant will commence growing by the usual time of spring planting.

To prevent heaving by the action of the frost, and throwing out the plants—a very serious matter if not prevented—a furrow should be turned on the plants from each side after planting in fall; or they should be mounded up with the hoe. This should be levelled down again in the spring.

Having prepared the ground well, as before stated, with plow, subsoiler, and harrow, run off the distances for the rows with a plow, making a clean furrow nine or ten inches deep—being careful, if crooked, to straighten with a hoe or spade. Then set stakes the proper distances along the furrow, and plant at the stakes. Stand the plant at a slight angle against the perpendicular side of the furrow, and spread the roots nicely each way. Cover and pack the soil well around the roots.

DISTANCE

Most vineyardists choose to plant in rows about eight feet apart, and eight feet in the row. Some adopt six feet, or even less—according to the variety and the mode of training. Some of the strong-growing sorts require greater distances. Concord, Isabella, Hartford Prolific, Ives seedling, Clinton, and such need eight feet or more; while the little Delaware may do with four or five, and the Catawba, Iona, and similar ones with five or six. Where ground is plenty, it is best to allow plenty of room.

NUMBER PER ACRE

An acre of ground contains 43,560 square feet, or 4,840 square yards. It will require for planting the numbers specified in the following estimate, viz.:

At distance of 10 by 10 feet....	435 plants
At distance of 9 by 9 feet....	537 plants
At distance of 8 by 8 feet....	680 plants
At distance of 6 by 6 feet....	1,210 plants

For Concords, 10 by 10—certainly not less than 9 by 9—is desirable, giving plenty of

room for the plow and cultivator, and also sufficient distance to train on the trellis.

Where the ground is level, or nearly so, the rows should be run north and south, thereby giving more sunshine and freer circulation of air. If it be hilly—and it is presumed that grapes will be more frequently planted on hilly and uneven ground than elsewhere—the rows should be run across the slope, so as to make the cultivation as near on a level as possible, in order that the ground shall not wash.

SELECTION OF PLANTS

In purchasing from a nursery, No. 1 yearling plants are generally preferred. Two-year-old plants cost more in price and for transportation, are not so likely to live, and will gain little, if any, in point of time. Good No. 1 plants, from honest nurserymen, should have four to eight roots not less than two feet long, and a corresponding growth of top. Before transplanting, all roots should be cut back to eighteen or twenty inches, and the top shortened to two eyes, and these should be set nearly level with the ground.

CULTIVATION

The young plant should be allowed to take its own course the first year after transplanting. No pinching, no tying-up, is necessary. But the ground should be kept well tilled and clear of weeds, by the free use of the cultivator and hoe. A row of early cabbages, beans, beets, or other root crop may be beneficially grown between. In a favorable season, the strong-growing sorts will usually make a growth of five or six feet in length, and, in some cases, as much as ten or fifteen feet, the first year.

TRAINING AND AFTER-CULTURE

We have now got our plants with two-year-old roots and stems one year old. The after-management is various. It is best, however, that this one-year vine should not be permitted to bear fruit the next season: which it would do if left to itself. It should now be cut back to two eyes, and protected during winter by a slight covering of straw, or some other light litter.

And here comes up the question of winter protection. What shall be done with our vines, now that we have got them planted and growing? Shall they be protected, or shall they be left exposed to the rigors of the winter, and run the risk of life or death? Some will say—Let them alone; plant only such varieties as will not need winter protection. Others, claiming that whatever is worth doing at all is worth doing well, advise protection. It is very desirable, certainly, that we shall be able to secure such varieties as will withstand the rigors of our winters without this labor and care; and there are such; but it must be confessed that they—as in the case of many other fruits—are not of the best sorts. It is also equally evident that, as a rule, the great mass of grape-growers—the million—*will not*, however much they may be urged, be induced to adopt any system of winter protection that involves care and trouble.

The Concords, the Clintons, the Iveses, the Nortons, and others, may get along safely through most winters without protection; but if we expect to obtain the luscious Delaware, the Rebecca, the Maxitawny, or even the Catawba, we must make up our minds to protect.

The mode of protection usually practiced is to lay the vine down upon the ground and cover with earth to the depth of an inch or two. This requires that the annual trimming shall be done in the fall, before the freezing weather commences. In most vineyards, where protection is not practiced, this work is omitted till in the winter or early spring.

This question of protection we shall leave for each one to judge for himself, according to circumstances; with the additional remark, that of the varieties named in the preceding list, probably one-half had better be protected, north of Ohio and Pennsylvania, while the other half may get along without it.

Different modes of training are adopted. Some tie to stout stakes, six or seven feet high, one to each plant. Where wood is scarce and costly, this is an expensive mode. The most common method is to use a trellis of wire. For this purpose, posts are set in the ground at proper distances—say twenty feet—and wire fastened to these horizontally. The posts at the ends should be firmly set and braced, in order that the strain of the wire shall not loosen them. The wire is fastened to the posts by means of small staples, to be had at the hardware stores. Three wires are usually required, placed twenty inches or two feet apart, and the lower one a foot or so from the ground.

Manufacturers now supply a wire especially for the purpose. This annealed wire,

No. 12, is strong, and will answer; but No. 10 is heavier, and will last longer. To wire an acre of trellis, the cost will be from thirty to sixty dollars, while the posts, at ten cents each, may bring the sum total to from sixty to one hundred dollars, according as wood and labor are costly or cheap. Inferior trellis, made of split or sawed slats, may be obtained at cheaper rates in places where wood is plentiful. A primitive mode of building a trellis is to use split poles, obtained from the woods when the bark will peel; these, while answering a present purpose, will be of short duration.

PRUNING

On this subject there is a great diversity of opinion, and the limits of this work will not permit of a lengthy treatise on the subject. It is proper to say, that the tendency to vine-growth is a check to the fruiting; and that cultivators consider it necessary to counteract this excessive growth by pinching and pruning. Many carry this practice to excess; and with spring and summer pinching, and fall and winter pruning, we believe, very materially injure their vines.

In this description of the pruning process, we shall condense from various treatises on the subject. Buchanan, a practical Cincinnati vineyardist of several years ago, says:—

"In the second spring after planting, cut down to two or three eyes, or joints, and the third year to four or five; pinching off laterals and tying up. . . . Pruning the fourth year requires good judgment, as the standard stem or stalk has to be established. . . . Select the best stem or cane of last year, and cut it down to six or eight joints; . . . the other cane cut down to a spur of two or three eyes, to make bearing-wood for the next season."

His mode has reference to tying to upright stakes, instead of trellis, and must be varied accordingly. He says: "In the succeeding and all subsequent years, cut away the old bearing-wood, and form a new bow, or arch, from the best branch of the new wood of the last year, leaving a spur as before, to produce bearing-wood for the coming year; thus keeping the old stalk of the vine down to within eighteen to twenty-four inches from the ground. The vine is then always within reach and control." This is the renewal system.

Spur pruning consists in continuing the old or main stem, and annually cutting back the laterals to two or three good buds. A blending of the two is often practiced.

For summer pruning, we can do no better than to quote from Husmann, a noted Missourian grape-grower and writer. He says:

"We are glad to see that the attention of the grape-growers of the country is thoroughly aroused to the importance of this subject, and that the practice of cutting and slashing the young growth in July and August is generally discountenanced. It has murdered more promising vineyards than any other practice. But people are apt to run into extremes, and many are now advocating the 'let alone' doctrine. We think both are wrong, and that the true course to steer is in the middle.

"1. Perform the operation *early*. Do it as soon as the shoots are six inches long. At this time you can oversee your vine much easier. Every young shoot is soft and pliable. . . . Remember that the knife has nothing to do with summer pruning. Your thumb and finger should perform all the work, and they can do it easily if it is done early.

"2. Perform it thoroughly and systematically. Select the shoots you intend for bearing wood for next year. These are left unchecked; but do not leave more than you really need. Remember that each part of the vine should be thoroughly ventilated, and if you crowd it too much, none of these canes will ripen their wood as thoroughly, nor be as vigorous, as when each has room, air, and light. Having selected these, commence at the bottom of the vine, rubbing off all superfluous shoots, and all which appear weak and imperfect. Then go over each arm or part of the vine, pinching every fruit-bearing branch above the last bunch of grapes.

"We come now to the second stage of summer pruning. After the first pinching, the dormant buds in the axils of the leaves, on fruit-bearing shoots, will each push out a lateral shoot opposite the young bunches. Our second operation consists in pinching each of these laterals back to one leaf *as soon* as we can get hold of the shoot above the first leaf, so that we get a young, vigorous leaf additional, opposite to each bunch of grapes. These serve as elevators of the sap, and also as an excellent protection and shade to the fruit. Remember, our aim is not to rob the plant of its foliage, but to make *two* leaves grow where there was but one before, and at a place where they are of more benefit to the fruit."

INSECTS AND DISEASES

Mildew and *rot* are the chief diseases affecting the grape, and are both believed to be caused by atmospheric influences. Excessive rains and damp, sultry weather are deemed the chief causes of these allied diseases. No specific remedy has been found, as no means of preventing the recurrence of the unfavorable causes are within human reach.

Of insects, there are several that are quite destructive to the grape plant, among which the most formidable is the phylloxera, a tiny insect which, in its several stages, is lately making deadly havoc among the vineyards of both Europe and America—affecting the roots as well as the foliage. In its work upon the foliage it does comparatively little injury, but its work upon the roots is very destructive—eating away the fibrous portions, and causing them to decay and die.

Not only is the phylloxera one of the most destructive of all tree and plant parasites, but it is also one of the most difficult to destroy. For a while, indeed, its activity seemed destined to destroy the vineyard industry of France, and large rewards were offered for some ready and efficient method of dealing with it. Nearly the most effective measure so far adopted has been found in planting a large tract—nearly 1,000,000 acres of vine lands—with American vines, which have proved largely proof against the ravages of phylloxera. Direct applications of carbon bisulphide, potassium sulphocarbonate, and emulsions of crude petroleum have accomplished much good in numerous cases. Since, however, the eggs and larvæ are found both on the leaves and in the roots, all chemical insecticides must be very thoroughly used if any result is to be expected.

The *leaf-hopper* is a troublesome insect on some varieties. It is an active little beetle, and works on the under side of the leaves, causing them to assume a deadly appearance in spots, and finally killing the leaf entirely. Soapsuds have been recommended as a remedy; also tobacco infusion thrown upon them with a syringe.

The *leaf-folder* is a green worm that folds itself up in the leaf, where it goes into the chrysalis state. The parent moth appears in the spring and deposits her eggs, which hatch and fold themselves up during the summer. The increase of both this and the leaf-hopper may be checked by raking up and burning the leaves in the fall.

There is also a *grape curculio,* inferior in size to the plum curculio, but with habits somewhat similar. It punctures the fruit and deposits an egg, which hatches a worm to live on the juices. This larva leaves the berry during summer, and passes into the ground. It is believed, however, to issue again in the fall as a beetle, and thus pass the winter.

Many other more or less destructive insect enemies of the grape might be mentioned.

THE HORSE

THE early history and origin of the horse is wrapped in obscurity and fable, and we really know little or nothing of it, except that we have reason to believe that he first came from Asia, like man. He was used in Egypt more than 1600 years before Christ. Wild horses exist to the present day in the interior of Asia and in South America. But both the horses of the Tartars and those of La Plata are descended from the domesticated animals, and can scarcely be called wild in the ordinary acceptation of the term. From their constant state of liberty, and their roving habits, in order to obtain food and water, they are inured to fatigue, and can bear an enormous amount of long-continued fast work, without failing under it, and without that training which the domesticated animal must have. The walk and the gallop are the horse's natural paces, and all others are acquired; but nothing can exceed the fiery animation and elegance of movement of the free horse; and in these two paces art has done nothing to improve his form, except, perhaps, in slightly increasing the speed of the latter. In all countries, and in every age, the horse feeds upon grain or grass, though it is said that in Arabia he is occasionally supported upon camel's milk, when food such as he usually lives upon is not to be had.

THE POINTS OF A HORSE

THE two parts of the head of the horse which correspond to the temples in a man are above the eyes. The eyes themselves have a loose crescentiform fold of the conjunctiva at the inner angle, often erroneously called *membrana nictitans*, but it neither performs its office nor possesses its muscular apparatus. The orbit, which is formed of seven bones, four cranial and three facial, contains the globe of the eye, on the inner angle of which is situated the haw. The eye-pits are deep indentations which lie between the eye and the ear, above the eyebrows on each side.

The face is the front of the head from the eyes to the nostrils; this part corresponds to the upper part of a man's nose. This name is, however, generally applied to that portion that surrounds the curl or centre on the forehead from whence the hair radiates.

The neck of the horse is designated by the word crest; it is comprised from one end to the other between the mane on the

upper side and the gullet on the lower. The forelock is the portion of the mane which is on the top of the head and falls over on the forehead between the eyes.

The withers is the spot where the shoulders meet up above, between the back and the neck, at the point where the neck and the mane come to an end.

The chest is that part which is in front between the shoulders and below the throat.

The back commences at the withers and extends all along the spine as far as the crupper. When the horse is fat, the whole length of the spine forms a kind of hollow which is said to be channeled.

The space which is included within the ribs is called the barrel; the name of stomach is also given to the lower part of the body which joins the os sternum and the bottom of the ribs.

The flanks lie at the extremity of the stomach and extend as far as the hip-bones. The tail is divided into two parts: the stump or dock, and the hair.

The upper part of the front leg of the horse is called the shoulder, although it corresponds with the fore-arm in a man; the fore-arm follows it lower down.

The joint which is below the fore-arm is called the knee; it corresponds to the place of the wrist in man, and forms an angle turning inward when the leg is bent.

The shank forms the second portion of the fore-leg; it commences at the knee-joint, and corresponds to the metacarpus in man.

Behind the shank is a tendon, which extends from one end to the other, and is called the back sinew.

The fetlock joint is the articulation immediately below the shank.

The fetlock itself is a tuft of hair covering a sort of soft horny excrescence, which is called the ergot.

The pastern is the portion of the leg between the fetlock joint and the foot.

The coronet is an elevation lying below the pastern, and is furnished with long hair falling over the hoof, all round the foot.

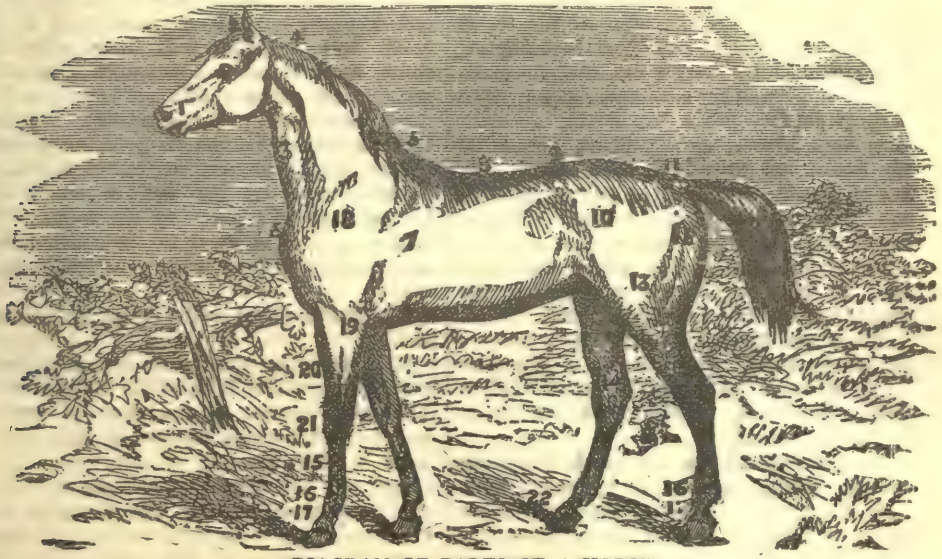


DIAGRAM OF PARTS OF A HORSE

1. Muzzle and parts about the muzzle; 2. Gullet; 3. Windpipe; 4. Crest; 5. Withers; 6. Chest; 7. Girth; 8. Back; 9. Loins; 10. Ilium or Hip; 11. Croup; 12. Haunch or Quarters; 13. Thigh; 14. Hock; 15. Shank or Cannon; 16. Fetlock; 17. Pastern; 18. Shoulder-bone or Scapula; 19. Elbow; 20. Fore-arm; 21. Knee; 22. Coronet

The hoofs form, so to speak, the nails of the horse, and consist of a horny substance.

In order to describe the parts which make up the hind legs of the horse, we must go back to the haunches. Each of these contains the femur, and corresponds to the thigh of a man. It is, therefore, the thigh of the horse, which is joined on to the body, and bears the name of buttocks. It is terminated below and in front by the stifle, which is the joint of the knee

containing the knee-pan. It is situated below the haunch on a level with the flank, and shifts its place when the horse walks.

The highest part of the hind-leg, which is detached from the body, is called the thigh, or gaskins, and corresponds to the leg of a man. It extends from the stifle and lower part of the buttocks down to the hock.

The hock is the joint which is below the thigh, and bends forward. This joint represents the instep in a man; the hinder part of the hock, which is called the point of the hock, is the *heel.*

Below the hock are the shank, the fetlock joint, the pastern, and the foot, just the same as in the fore-legs.

We will now say a few words as to the diversity of color in the coat of the horse, in order to fix the meaning of the terms which are generally employed to designate the various hues which the coat presents.

Bay is a reddish nut-brown color, with various shades. Dark bay horses are of a very dark brown, almost black, except on the flanks and tip of the nose, where they are of a reddish color. The golden, or light bay, is a yellow sunlight hue. Dapple-bay horses have on their rumps spots of a darker bay than on the rest of their bodies. In bay horses the extremities, the mane, and the tail are always black.

There are three kinds of black horses: the rusty black, which is of a brownish tinge, more or less conspicuous in various lights; the black, and the coal-black, which is the darkest of all.

Dun-colored horses, of which there are several shades, are of a yellowish-sandy hue; the mane and tail of these are either white or black. Some of the latter have a black line along the vertebræ, which is called a mule's, or eel-stripe.

Chestnut is a kind of reddish or cinnamon-colored bay. There are several shades of it, among which are the bright chestnut, which is the color of a red cow's coat; the common chestnut, which is neither dark nor bright; the bay chestnut, which verges upon the red; the burnt chestnut, which is dark, and nearly approaches black. Some chestnut horses have white manes and tails, others black. The roan is a mixture of red and white.

Gray horses have white hair mixed with black or bay. There are several modifications of this color; the dapple-gray, the silver-gray, the iron-gray, etc. Dapple-gray horses have on the back and other parts of the body a number of round spots; in some cases black, in others a lighter hue; these spots are somewhat irregularly distributed. Gray horses as they increase in age become lighter in color, ultimately becoming white.

Piebald and skewbald horses are white, with large irregular spots and stripes of some other color, irregularly arranged. The different kinds are distinguished by the color that is combined with the white, as the piebald proper, which are white and black; the skewbald, which are white and bay; the chestnut piebald, which are white and chestnut.

The horses which have small black spots on a white or gray coat are called flea-bitten, and are particularly prevalent in India among Arabs.

We have hitherto considered the wild and domestic horse in common, both as regards their structure and their color; in short, their outward appearance generally, without noticing the different breeds, which must soon occupy our attention. But before we enter upon the study of the various equine races, it is necessary to give a short explanation as to the way in which the bit regulates the paces of the horse. By this we are led to speak of the construction of the mouth, a knowledge of which is most useful.

The horse either walks, trots, gallops, or ambles.

The paces of the horse are essentially modified by means both of the bit and spur. The spur excites a quickness of movement; the bit communicates to this movement a due amount of precision. The mouth of the horse is so sensitive that the least movement or the slightest impression which it receives warns and regulates the motion of the animal. But to preserve the full delicacy of this organ, it is highly necessary to treat tenderly its extreme sensibility.

The position of the teeth in the jaw of the horse affords to man the facility which exists in placing a bit in its mouth, by which instrument this high-spirited and vigorous animal is broken in and guided. Let us, therefore, in the first place, study the arrangement of its mouth.

There are in each jaw six incisors, or fore-teeth, followed on either side by a tush, which is generally deficient in mares, especially in the lower jaw. Next comes a series of six grinders on each side in both jaws; these teeth have a square crown, marked with four crescents, formed by the *laminæ* of enamel which are imbedded

on them. Between the tushes and the grinders there is a considerable space called the bar, which corresponds to the angle of the lips; and it is in this interval that the bit is placed.

It is also by means of the teeth that we are enabled to know a horse's age—a knowledge which is of the highest utility; for a horse increases in value in proportion as he approaches maturity, again decreasing in worth as he becomes older. Up to nine years the age can be determined pretty accurately by means of the changes which take place in the teeth.

The foal, at its birth, is usually devoid of teeth in the front of the mouth, and has only two grinders on each side in each jaw. At the end of a few days, the two middle fore-teeth, or pincers, make their appearance. In the course of the first month a third grinder shows itself, and in four months more the two next fore-teeth also emerge; within six and a half or eight months the side incisives, or corner-teeth, show, and also a fourth grinder. At this period the first dentition is complete. The changes which take place up to the age of three years depend only on the fore-teeth being worn away more or less, and the black hollows being obliterated gradually by contact with food. In thirteen to sixteen months the cavities on the surface of the pincers are effaced; they are then said to be razed. In sixteen to twenty months the intermediate fore-teeth are likewise razed, and in twenty to twenty-four months the same thing takes places with the corner-teeth.

The second dentition commences at the age of two and a half or three years. The milk-teeth may be recognized by their shortness, their whiteness, and the construction round their base, called the neck of the tooth. The teeth which replace them have no necks, and are much larger. The pincers are the first to fall out and be replaced by new ones. At the age of from three years and a half to four years the intermediate fore-teeth experience the same change, and the lower tushes begin to make their appearance. The corner-teeth are also renewed when between four and a half to five years; the upper tushes likewise pierce the gums, and about the same date the sixth grinder shows itself.

A depression, or small hollow, may be noticed on the surface of the crown of the second growth of fore-teeth, just as in the milk-teeth, and these hollows are gradually worn away in the same fashion.

The pincers of the lower jaw lose their cavities when the horse is five or six years old; the intermediate fore-teeth are the next to raze. The marks in the corner-teeth are obliterated at the age of seven or eight years. The process of destruction of the marks in the upper fore-teeth goes on in the same order, but more tardily.

When all these various changes have taken place, the horse is looked upon as aged, because the teeth no longer furnish any certain indications as to the age of the animal. Only approximate inferences can now be drawn from the length and color of the tushes, which become more and more bare and projecting from the gum, etc.

The domestication of the horse appears to date back to the very earliest period of his appearance on earth; and as this animal adapts itself to every necessity, every want, and every climate, its subjection has resulted in a considerable number of races, distinguished by more or less prominent characteristics of shape, strength, temper, and endurance. Although generally intelligent, affectionate, and endowed with considerable powers of memory, these qualities in the horse are essentially modified by education and climate. And for the full development of his intelligence and his high qualities, it is requisite that man should be his companion and his friend, as well as his master, but never his tyrant. Under the whip of an unfeeling driver, the horse becomes brutalized, and rapidly degenerates, morally even more than physically.

The influence of memory on the horse is shown by the sense it retains of injuries and ill-treatment it has suffered. Many a horse is restive with persons who have misused it, while perfectly docile with others, proving a consciousness of good and evil, and a natural insubordination against tyranny and injustice.

PRESENT VARIETIES

THE ARABIAN is still one of the most distinct varieties of this noble animal, and also one of the most prized, being eagerly sought for by Turks and Christians in Asia, Southern Russia, India, and even in Australia. In his native deserts he is still sometimes to be seen in a half-wild state, though most probably owned by some of the "dwellers in tents" peculiar to that region. But it is the more domestic breed with which we have chiefly to do, and which is carefully preserved in a pure state by the chiefs of

the various tribes, though it is supposed not so free from stain now as was formerly the case. The head of the Arab is the most beautiful model in nature, giving the idea of courage, tempered with docility and submission to man, better than any other animal, and even more so than the dog. It is seldom, perhaps, that so beautiful a frame exists; but examples are not wanting of such a union of elegance with perfectly good and useful points. The length and muscularity of the fore-arm are also remarkable, and the setting on of the tail is peculiarly high—points which have generally been transmitted to our thoroughbred horses descended from Arabian blood. Many imported horses of this breed are exceedingly wicked and full of tricks, but in India, as a rule, he is quite the reverse. To the modern sportsman also he is valuable, because he faces the elephant and the tiger better than any other breed. In height, he is generally a little under fifteen hands; and in color, either bay, black, or gray. It is said that there are three distinct breeds of Arabians even now—the Attechi, a very superior breed; the Kadischi, mixed with these, and of little value; and the Kochlani, highly prized, and very difficult to procure. If this is true, it may account for the very different results produced by breeding from modern Arabs and those introduced in the eighteenth century.

The BARB is an African horse, of smaller size but coarser make than the Arabian, and evidently fed upon more nutritious food. As his name implies, his native land is Barbary; but there is always great doubt about the particular breed to which imported horses belong, because they are carried considerable distances from their native plains, and are also even then much mixed in blood. It has frequently been said that the Barb is the progenitor of one root of the best English stock, and that the Godolphin Arabian, as he was called, belonged to this blood; but the disputed point can not possibly be settled, and there seems only one argument in favor of the supposition, founded upon his enormously high crest; while his superior size—he was 15 hands high—argues just as strongly in favor of Arab descent. But the Spanish horse is no doubt descended from the Barb, this breed having been carried into Spain by the Moors when they overran the country; and, as the appearance of the Spanish horse is totally opposed to that of the descendants of Godolphin, it is a still stronger proof of his Arabian ancestry, or, at all events, an argument against his claim to Barbary as a native clime.

The DONGOLA horse is another African variety, of a much larger size than either the Arab or the Barb, but more leggy. We are not aware that any of this breed have reached this country.

The PERSIAN is a small-sized horse, and quite as elegant as the Arabian, but not nearly so enduring.

The TURKOMAN, again, is a larger breed, but without the elegance of form of the Arab and Persian. They are light in the barrel, and leggy, with coarse heads and ewe-necks; yet they are endowed with very stout and lasting qualities, and they are said to travel very long distances without distress. This is only another instance of the oft-quoted adage, "that the horse can go in all forms."

The COSSACK horses are reared at liberty, and in large herds, and they were long said to be, in consequence of this fact, of unrivaled speed and stoutness.

The TURKISH horse is supposed to be nearly pure Arab, with a cross of the Persian and Turkoman. He is a very fine, high-spirited, and elegant horse.

The EAST INDIAN and AUSTRALIAN horses are of various mixed breeds, some being Arabs, some Persians, and others Turks and Barbs; while others again are of English blood, but these degenerate rapidly, and though serviceable in crossing with the Arabian or the Barb, yet they can not long be maintained in their original purity without injury.

The BELGIAN and DUTCH horses for slow work are very serviceable. They are, however, most of them too heavy and lumbering for anything but machiners, and even in that department they require care not to overdrive them.

The NORMAN horse, again, is a much more hardy and compact animal. He is, however, gifted with an excellent constitution, and with legs and feet which will stand rattling to any extent. These horses are generally low and short-legged, as compared with the Belgians.

The SPANISH horse is much crossed with the Barb, and has the good head and neck of that breed, but coupled with a weak and drooping hind-quarter and a very light middle-piece. The shoulders and legs are, however, good.

The AMERICAN and CANADIAN breeds vary a great deal, and are made up of the original Spanish stock crossed with English, Arabian, and Barb importations. Climate, however, has done much for them; and they have all the wiriness of frame and elasticity of muscle which their masters possess. As trotters they are unrivaled, and in endurance stand very high; but they are not remarkable for beauty, though not showing any peculiarly unsightly points. Some of the best breeds of horses have been imported by us, especially in Virginia, where Tranby, Priam, and many others have done good service. Our importers have always been careful to select *sound* as well as stout blood and have not hesitated to invest large sums in order to procure it.

The ENGLISH THOROUGHBRED.—England is indebted to the Stuarts for the first great improvement made in the breed of her horses, James I and Charles I having introduced the Arabian blood, and Charles II laying the foundation of her present breeds by importing several mares (called Royal Mares, from their master), to which may be traced the celebrated horses of the latter end of the last century, and some of her best modern breeds. Numerous Eastern horses were also imported at various times.

The THOROUGHBRED horse is intended for racing only. The height of the race horse varies from 15 hands to 16½ hands, or even 17 hands; but the general height of our best horses is about 15 hands 3 inches.

The head and neck should be characterized by lightness, which is essential to this department. Whatever is unnecessary is so much dead weight, and we know the effect of 7 lb. in impeding the horse over a distance of ground. Now 7 lb. are easily bestowed upon a neck which may differ in at least 20 or 30 lb. between the two extremes of lightness and excessive weight. Thus, it may be considered as indubitable that whatever is met with in the head and neck, which is not necessary for the peculiar purposes of the race horse, is so much weight thrown away, and yet it must be carried by the horse. Such is the general character of this part; but, in detail, the head should be lean about the jaw, yet with a full development of forehead, which should be convex and wide, so as to contain within the skull a good volume of brain. Supposing this fulness to exist, all the rest of the head may be as fine as possible; the jaws being reduced to a fine muzzle, with a slight hollowing out in front, but with a width between the two sides of the lower jaw where it joins the neck, so as to allow plenty of room for the top of the windpipe when the neck is bent. The ears should be pricked and fine, but not too short; eyes full and spirited; nostrils large, and capable of being well dilated when at full speed, which is easily tested by the gallop, after which they ought to stand out firmly, and so as to show the internal lining fully. The neck should be muscular and yet light; the windpipe loose and separate from the neck—that is, not too tightly bound down by the fascia, or membrane of the neck. The crest should be thin and wiry, not thick and loaded, as is often seen in coarse stallions, or even in some mares. Between the two extremes of the ewe-neck and its opposite there are many degrees, but for racing purposes we should prefer, of the two, the former to the latter; for few horses can go well with their necks bent so as to draw the chin to the bosom; but here, as in most other cases, the happy medium is to be desired.

The body, or middle-piece, should be moderately long, and not too much confined between the last rib and the hip-bone. So long as the last or back-ribs are deep, it is not of so much importance that they should be closely connected to the hip-bone, for such a shape shortens the stride; and though it enables the horse to carry great weight, yet it prevents him from attaining a high rate of speed. The back itself should be muscular, and the hips so wide as to allow of a good development of the muscular department. The withers may rise gently, but not too high, with that thin razorlike elevation which many people call a good shoulder, but which really has nothing to do with that part, and is only an annoyance to the saddler, who has to prevent its being pinched by the saddle. The chest itself should be well developed, but not too wide and deep: no horse can go a distance without a fair "bellows-room"; but, supposing the heart to be sound and of good quality, the amount of lung will suffice which may be contained in a medium-sized chest: and all above that is wasted, and is extra weight. If the chest be too wide, it materially affects the action of the fore-legs, and, therefore, in every point of view, theoretically and practically, there is a happy medium between the too great contraction in this department and the heavy, wide, lumbering chests sometimes seen even in the thoroughbred race horse, especially

when reared upon rich, succulent herbage, more fitted for the bullock than the Eastern horse. In the formation of the hips, the essential point is length and breadth of bone for muscular attachment, and it matters little whether the croup droops a little, or is pretty straight and level, so that there is a good length from the hip to the haunch-bone; the line between which two points may either be nearly horizontal, or form a considerable angle with the ground; but still in both cases it should be a long line, and the longer it is the more muscular substance is attached to it and the greater leverage will the muscles have.

The fore-quarter, consisting of the shoulder, upper and lower arm, and leg and foot, should be well set on to the chest; and the shoulder-blade should lie obliquely on the side of that part with a full development of muscle to move it, and thrust it well forward in the gallop. Obliquity is of the greatest importance, acting as a spring in taking off the shock of the gallop or leap, and also giving a longer attachment to the muscles, and in addition enabling them to act with more leverage upon the arm and leg. The shoulder should be very muscular, without being overdone or loaded, and so formed as to play freely in the action of the horse. The point of the shoulder, which is the joint corresponding to the human shoulder, should be free from raggedness, but not too flat; a certain degree of development of the bony parts is desirable, but more than this leads to a defect, and impedes the action of this important part. The upper arm, between this joint and the elbow, should be long, and well clothed with muscles; the elbow set on quite straight and not tied to the chest; the lower arm muscular and long; knees broad and strong, with the bony projection behind well developed; legs flat, and showing the suspensory ligament large and free; pasterns long enough without being weak; and the feet sound, and neither too large nor too small, and unattended with any degree of contraction, which is the bane of the thoroughbred horse.

The hind-quarter is the chief agent in propulsion, and is therefore of the utmost consequence in attaining high speed. It is often asserted that the oblique shoulder is the grand requisite in this object, and that it is the part upon which speed mainly depends, and in which it may be said to reside. This is to some extent true, because there can be no doubt that with a loaded shoulder high speed is impracticable; for, however powerfully the body may be propelled, yet when the fore-quarter touches the ground, it does not bound off again as smartly as it ought to do, and the pace is consequently slow. For the full action of the hind-quarter two things are necessary, viz.: first, length and volume of muscle; and, secondly, length of leverage upon which that muscle may act. Hence, all the bones comprising the hind-quarter should be long, but the comparative length must vary a good deal, in order that the parts upon which the muscles lie may be long, rather than those connected with the tendons, which are mere ropes, and have no propelling power residing in them, but only transmit that which they derive from the muscles themselves. Thus, the hips should be long and wide, and the two upper divisions of the limb—viz., the stifle and lower thigh—should be long, strong, and fully developed. By this formation the stifle-joint is brought well forward, and there is a considerable angle between these two divisions. The hock should be bony and strong, free from gum or spavin, and the point long, and so set on as to be free from weakness at the situation of curb. In examining the hind-quarter to judge of its muscular development, the horse should not be looked at sidewise, but his tail should be raised, and it should be ascertained that the muscles of the two limbs meet together below the anus, which should be in fact well supported by them, and not left loose, and, as it were, in a deep and flaccid hollow. The outline of the outer part of the thigh should be full and in ordinary horses the muscle should swell out beyond the level of the point of the hip. This fulness, however, is not often seen to this extent in the thoroughbred horse until he has arrived at mature age, and is taken out of training. The bones below the hock should be flat and free from adhesions; the ligaments and tendons fully developed, and standing out free from the bone; and the joints well formed and wide, yet without any diseased enlargement; the pasterns should be moderately long and oblique; the bones of good size; and lastly, the feet should correspond with those already alluded to in the anterior extremity.

The totality of these points should be in proportion to one another—that is to say, the formation of the horse should be "true." He should not have long, well-developed hind-quarters, with an upright, weak, or confined fore-quarter. Nor will the converse serve; for, however well formed the

shoulder may be, the horse will not go well unless he has a similar formation in the propellers. It is of great importance, therefore, that the race horse should have all his various points in true relative development, and that there shall not be the hindquarter of a long racing-like horse with the thick, confined shoulder which would suit a stride less reaching in its nature.

THE COLOR, SKIN, HAIR, ETC.

The color of the thoroughbred horse is now generally bay, brown, or chestnut, one or other of which will occur in ninety-nine cases out of a hundred. Gray is not common, but sometimes appears. Black also occasionally makes its appearance, but not more frequently than gray. Roans, duns, sorrels, etc., are no longer mentioned, and the above five colors may be said to complete the list of colors seen on the racecourse. Sometimes these colors are mixed with a good deal of white, in the shape of blazes on the face, or white legs and feet; or even both may occur, and the horse may have little more than his body of a brown, bay, or chestnut. Most people, however, prefer the self color with as little white as possible; and nothing but the great success of a horse's stock would induce breeders to resort to him if they were largely endowed with white. Gray hairs mixed in the coat as in the Venisons are rather approved of than otherwise; but they do not amount to a roan in which the gray hairs equal, or even more than that, the other color mixed with them.

The texture of the coat and skin is a great proof of high breeding, and in the absence of the pedigree would be highly regarded; but when that is satisfactory it is of no use descending to the examination of an inferior proof; and therefore, except as a sign of health, the skin is seldom considered. In all thoroughbred horses, however, it is thinner, and the hair more silky than in common breeds; and the veins are more apparent under the skin, partly from its thinness, but also from their extra size and number of branches. The network of veins is of importance in allowing the circulation to be carried on during high exertions, when, if the blood could not accumulate in them, it would often choke the deep vessels of the heart and lungs; but, by collecting on the surface, great relief is afforded, and the horse is able to maintain such a high and long-continued speed as would be impracticable without their help. Hence, these points are not useful as a mere mark of breed, but as essential to the very purpose for which that breed was established.

The mane and tail should be silky and not curly, though a slight wave is often seen. A decided curl is almost universally a mark of degradation, and shows a stain in the pedigree as clearly as any sign can do. Here, however, as in other cases, the clear tracing of that all-powerful proof of breeding will upset all reasoning founded upon inferior data. The setting on of the tail is often regarded as of great importance, but it is chiefly with reference to appearances; for the horse is not dependent for action or power upon this appendage.

The various breeds of WAGON horses are exceedingly numerous. Most of the larger and heavier breeds of these animals are crossed with the Flemish horses, and are thereby rendered heavier and more capable of moving heavy weights, which their bulk and readiness to try a "dead pull" render them well adapted for.

CARRIAGE horses are either ponies, gig horses, brougham horses, or coach horses; being gradually larger and heavier from one end to the other of the line, which begins at the size of a small pony and extends up to the carriage horse of 17 hands. Ponies are of various breeds, some of which are of wonderful powers of endurance, with good symmetry and action, and with never-failing legs and feet. In general soundness they far excel the larger varieties of the horse, for which there is no accounting, as they are much more neglected and frequently very ill-used. A broken-winded pony, or a roarer, is a very uncommon sight, and even a lame one is by no means an every-day occurrence. Some are good trotters and yet bad gallopers, and they are consequently as well fitted for harness work as they are unfitted for hunting.

The SHETLAND PONY is the least of the species, and often under 11 hands. These ponies are very quick and active, and will walk, canter, and gallop, with good action, but seldom trot well.

THE STABLE-YARD

STABLE.—Every one will prefer to have the stables near his house, if not on his own premises; in either case, if they are already built, he must do the best he can with them. Old buildings are for the most part very defective, badly drained, and badly ventilated. This must at once be

remedied, and may generally be done at a moderate expense, which will be amply repaid by the improved health and comfort of the horses. New stables are better, but they also frequently require alteration.

ASPECT.—When about to build a stable, the first consideration will naturally be the selection of a site. We need not insist on the advantages of a southerly aspect: they are almost self-evident. The stables will be much more cheerful and much warmer, and enable the groom to avail himself of every gleam of sunshine to open the windows and thoroughly ventilate the interior.

Unfortunately it is not always possible, from the disposition of the ground and premises, to manage this. However, let it be borne in mind that such is the best, the west the next best, and the northeast the very worst.

It should not be forgotten, also, that a thorough drainage is one of the most important points, and every natural slope of the land should be taken advantage of in this respect.

DRAINAGE.—Having settled the site and the plans of the stables, to which we will refer further on, the first works to be provided for will be the drainage, for these will have to be carried out simultaneously with the foundations. The drains will be of two sorts, which should be kept as far away from one another as it is possible to manage: first, those connected with the drainage of the interior of the stables; second, those intended to carry away the surface-water and collect the rain-water from the roofs, etc.

SEWERS.—There are four conditions which are to be regarded as indispensable in the construction of all drains from all buildings whatsoever. These conditions are: First, that the entire length of drain is to be constructed and maintained with sufficient declivity toward the discharge into the cesspool, to enable the average proportion and quantity of liquid and solid matters committed to it to maintain a constant and uninterrupted motion, so that stagnation shall never occur. Secondly, that the entire length of the drain is to be constructed and maintained in a condition of complete impermeability, so that no portion of the matters put into it shall accidentally escape from it. Thirdly, that the head of the drain shall be so efficiently trapped that no gaseous or volatile properties or products can possibly arise from its contents. And, fourthly, that the low extremity of the drain or point of communication with the cesspool shall be so completely and durably formed, that no interruption to the flow of the drainage or escape shall there take place, and that no facility shall be offered for the upward progress of the sewage in case of the cesspool becoming surcharged.

For most purposes a fall of 2½ inches in 10 feet will be sufficient, and the drain should be of 3-inch glazed stoneware pipes (4 inches for w.c.), with carefully made socket-joints laid in the direction of the current, and cemented. For the head of the drain we would recommend the bell-trapped horse-pots, which are to be had at all stable-furnishing ironmongers, taking care that they are sufficiently large and of good strong quality.

The cesspool for sewage should be well away from the tank provided for the reception of the rain-water, and well puddled with clay on the outside and cemented inside. Precaution should also be further taken that all sewage drains should be laid below the rain-water drains, so that, in case of any accidental defects, no matter will, by any possibility, taint the water supply.

RAIN-WATER DRAINS.—These will subdivide themselves into two: those laid to collect the drainage of yard, etc., and which may be common pipes laid dry, and leading to an ordinary cesspool made of bricks laid without mortar, where the water will collect and gradually lose itself; the others connected with the down pipes from roofs, and leading to a rain-water tank. These should be laid with the same care as the sewer drains: the tank constructed in the same way, with an overflow pipe to lead to cesspool just mentioned.

PLANS.—The plan of the building will vary very much according to the aspect, disposition of land and other premises, and other local circumstances. These should be very carefully studied, and the plans well matured, as the success of the building will greatly depend on the disposition of its various parts.* We will lay down as one of the first principles that no stall should be less than 6 feet wide by 10 feet long, no loose box less than 10 feet square, and no stable less than 10 feet high from floor to ceiling. Passage in rear of stalls 5 feet wide.

The doors should be wide and high, and hung in two heights, with fanlight over (4 feet by 7 feet at least), that the horses

may go in and out freely without a chance of knocking themselves about.

The light should be full, as tending greatly to the cheerfulness of the interior. The sashes, also, should be hung on centres in their height, as the most advantageous method for ventilation.

VENTILATION.—To complete the ventilation, the only further requirement will be an opening in the ceiling—not immediately over the horses, but in the rear over the passage—fitted with an ornamental ventilating grating, to be shut and opened at will, leading to an air-flue laid between the joists, and conducting the foul air from the stables to the outside through an ornamental perforated air brick or iron grating. A similar ventilating grating, to regulate the admission of fresh air, will only be necessary where the doors and windows are small, and fit very accurately.

PAVING.—The materials for paving should be of the hardest quality, on good sound ballast or concrete foundation. Any absorbent materials must be rejected. The paving of boxes and stalls should be laid with a regular gentle slope to the drain, which should always be in the centre. Irrespective of other advantages, the horses stand on the level, and take their rest more comfortably.

PARTITIONS.—The partition for stalls will be match-lined both sides, and about 4 feet 2 inches in rear, with a ramp, and rising to 6 feet 2 inches toward the mangers; with iron pillar at the end next passage, with rings for pillar reins. Sometimes, also, the match-lining will be carried through in a level line, and by a cast iron the ramp form ornamental panel.

For loose boxes the boarding will be from 5 feet to about 5 feet 4 inches high at most, with a 2-foot ornamental iron panelling over.

MANGERS.—The best mangers are those containing hay-rack, corn-manger, and water-trough in one, and we more especially recommend that preference should be given to galvanized iron.

The wall over the manger should be match-boarded to the height of partitions, and lined with iron hoop bands, sheet zinc over the joints of match-lining, or enamelled tiles, to prevent horses biting at it when being cleaned.

The manger will have two rings for halter reins, and a ring and galvanized chain fitted in wall over same.

HARNESS-ROOM.—This should be at least 10 feet square, and have in it a fireplace fitted with range with boiler attached. A handy supply of hot water will be found most advantageous in the management of the stables, and we need not point out the necessity of a fire for drying the rugs, horse-cloths, saddles, harness, etc., in winter time.

This room should be fitted with convenient hooks and brackets for the hanging and cleaning of harness. These are of all sorts of designs, in which individual taste will be the best guide.

HAY-LOFT AND CORN-CHAMBER.—In most stables, in addition to the coachman's rooms, there are a corn-chamber and hay-loft over the stable. The former is generally boarded off, lined all round with sheets of zinc or tin to keep out the vermin, and the door is provided with a lock, of which the coachman keeps the key, and gives out at stated times the corn for so many horses for so many days. By this means he keeps a check upon the consumption, and prevents waste and pilfering; both of which are more likely to occur when the supply is unlimited and easy of access. When there is not a regular corn-chamber, one must either be made or a large bin provided, and the oats bought from the corn merchant as required, in quantities of two or three quarters at a time, as many as the bin will contain, which will be found a more expensive proceeding. Hay, from being bulky, is almost invariably stowed away in the loft, which should hold at least half a load; it must be stored away carefully, and nothing allowed to run about or play on it. Hay will keep good and sweet for some time, if in a dry place and not meddled with. If the loft be large enough, it will be found better and cheaper to buy a load at a time; if not, or the loft be damp, a smaller quantity must suffice.

STABLE UTENSILS.—Under this head is included all that is used in dressing the horse, and in cleansing the yard and stable.

The pitchfork is used to shake up the straw of which the horse's bed is made; to remove all that becomes soiled and dirty; and, in general, to set it fair and straight. The handle should be kept clean and the prongs bright.

The shovel removes the smaller particles and the scrapings of the stable-yard.

The besom, or broom, is used to sweep

out the stable after the damp soiled litter has been removed, and to keep the yard neat and clean. Those made of birch are the best.

A manure-basket to take up the droppings. This should be done before trodden about, to keep the straw clean and the stable sweet.

The stable pail should be made of strong oak, bound with iron, and neatly painted.

A sieve, to cleanse the oats and chaff of all dust and small stones.

A peck and a half-peck measure, to measure out the oats, beans, chaff, etc., for each horse's feed.

The currycomb.—Horses of the present day are so much better bred than formerly, that their coats and skin are so much finer, and there is now much less use for the currycomb, except to remove the dust from the body-brush. On very rough-coated horses it may occasionally be used, but no other should ever be touched with it. In summer it is absolutely unnecessary, and, in these days of clipping and singeing, in the winter it is almost equally so. It must always be used lightly, or it will severely punish the horse, and on no account should the teeth be sharp, or more than one-eighth inch in length.

The body-brush, or horse-brush, as it is sometimes called, is, in the hands of a good groom, the most useful implement used in dressing the horse, as it thoroughly removes all dust and dirt, stimulates the skin, and imparts a gloss to the coat.

The water-brush is to wash all dirt and mud from the feet and legs of the horse, and stains from his quarters, etc.

The mane-comb, as the name implies, is to comb the mane and tail. It should be made of horn, have large teeth, and be used carefully and only occasionally, as in a general way a good brushing will answer the purpose without pulling out the hair.

The picker is a blunt iron hook for removing the grit and stones from the horse's feet. Some are made to fold up for the pocket. A good careful groom will always carry one of these.

A sponge, too, is always necessary to dry the legs, etc., after washing, and for other purposes of cleanliness.

Leathers and rubbers are also indispensable for drying the horse after work, and wiping him over after dressing.

An oil-brush and tin to hold the oil, to rub round the hoofs before leaving the stable to go to work.

A wooden box for holding the stopping.

A singeing-lamp and a pair of trimming-scissors are also necessary.

To avoid loss and confusion, there should be a place for everything and everything in its place, and all the utensils should be kept bright and clean.

Clothing, etc.—Every horse standing in a stable must have a head-collar, with two reins long enough to go through the two rings fastened to the manger, and to reach the ground after being each attached to a weight or block made of hard wood or iron, heavy enough to keep the reins from twisting or curling up, but not so heavy as to be a weight or strain upon the horse's head as he moves it. When in a box, too, a head-collar is always handy on the quietest horse; on a tricky or unruly animal it is absolutely necessary, as he can then be at any time easily secured without risk or trouble.

Halters.—Two good web-headed hempen halters are also requisite in every stable, to lead the horse about without having to use the head-collar.

Clothing.—There is a great variety of clothing, from the comparatively inexpensive to the most expensive in make and finish. These consist of blankets or rugs of different degrees of warmth and thickness according to the time of year, a roller, a suit of body-clothing, and a set of flannel bandages. The best material will be the cheapest in the end, as wearing so much longer than the cheaper kinds.

The blanket or rug should be cut back at the top of the shoulder, with a projecting piece on each side coming round and meeting in the centre of the chest, where they fasten with a buckle and strap. Each rug, too, should be bound with some strong material to prevent the edges tearing out. Two rugs will be found necessary for each horse.

A suit of body-clothing may be made of various materials, but strong warm serge is best for winter, and a lighter kind for summer wear. It consists of a quarter-piece, hood, and breast-piece, with roller to match. The roller must be well padded, to prevent bruising or injury to the back from pressure.

In winter, in a warm stable, a heavy rug and the body-clothing will be found sufficient during the day, but at night the latter should be removed to keep it clean, and another rug substituted.

The flannel bandages are put on after the horse has had his legs washed, to keep

them dry and warm. They are also of great service in illness, to keep up the circulation and warmth in the extremities. In hunting-stables, where the horses must be occasionally sweated, it will be necessary to have two or three spare rugs and hoods in use for that purpose, and which should be carefully washed and dried. The price of clothing varies so much according to the quality and finish that it is difficult to name any, but a respectable saddler will at any time give an estimate for the kind required.

HOW TO PURCHASE A HORSE

In his choice of a horse the purchaser will of course be guided by whether he wants one for riding or driving purposes: if for the former, he will be particular that the shoulder lies well back, and if strong, not loaded at the top or points—that he has a good back, deep body, clean, flat, wiry-looking legs, and free from large splints, curbs, spavins, etc.; that his feet are firm and of moderate size—neither large and flat, and therefore necessarily weak, nor strong and narrow like those of a mule. When a horse has natural feet of the latter description they are generally remarkably sound, and will stand a great deal of work; but, as a rule, that shape is produced by internal disease, rendering the horse unsound when put to work.

If for driving purposes, he need not be so particular about the shoulders; for harness, they may be stronger, heavier, and more upright, as many make capital harness horses that are, from their formation, very uncomfortable to ride.

Having met with one suitable for his purpose, the purchaser must not let a few dollars prevent his buying, if rather more than the price to which he had proposed to go.

THE HACK, OR RIDING HORSE

In selecting a riding horse much must depend upon the size and weight of the rider. The best and most useful size is from 15 hands to 15 hands 2 inches. The most fashionable colors are bay, brown, and dark chestnut. A really good riding horse, with good action and fine manners, is very difficult to find, as he must be good-looking, well made, sound, and temperate, with breeding substance, action, and courage. His head should be lean, the eye bold and prominent, the muzzle small, with large nostrils. The neck should be good, and slightly arched to bend to the bridle, shoulders lie well back and strong, but not heavy and loaded at the points, the body deep and round, strong back and loin, with good deep quarters and good firm legs and feet. He must ride lightly in hand, walk pleasantly and safely, trot freely, with good action, and canter easily, yielding to the bit without pulling. He must carry the saddle well back behind the shoulders; nothing is so uncomfortable or looks so badly in any description of riding horse as sitting on the top of the shoulders instead of behind them. The price will vary according to his action, manners, and appearance, as well as the weight he can carry. Many horses of this class are very fast and can trot up to twelve and fourteen miles an hour; but if they do seven or eight miles pleasantly and well, they will be fast enough, as few men care to ride faster.

The great defects to be avoided in purchasing a riding horse are: a loose weak neck—horses so formed invariably getting their heads up, and being very uncomfortable to ride; low upright shoulders; and twisted fore-legs—rendering the horse liable to hit either the inside of the knee or fetlock joint, which is very dangerous and likely to cause him to fall. A shy, nervous horse, too, should be avoided, as well as a hot, irritable one. Horses of a light chestnut color are very often so, and in company will not settle into any pace. Fifteen miles is a fair average day's work.

THE LADIES' HORSE

A perfect ladies' horse is of all descriptions the most difficult to find. So many good qualities, which, though desirable in all riding horses, may be overlooked in those for men, are here absolutely essential. Fine temper and courage, a light level mouth, and fine manners are indispensable. He should be from 15 hands to 15 hands 3 inches high, with a good head and neck, fine oblique shoulders, rather long in the body, with a good back and loin, deep strong quarters, firm sound legs and feet. If the hind-legs are rather bent, so much the better; he will get them more under him, and consequently his paces will be easier—horses with straight hind-legs invariably pitching most unpleasantly in the canter, which must be easy and elegant. As few ladies ride more than from 10 to 11 stone, including a 19 or 20 lb. saddle, and ease and lightness in action are indispensable, the ladies' horse should be very nearly thoroughbred, if not quite so.

He must walk well and freely, step lightly but sharply in the trot, with a rather long easy canter. He must be high-couraged and free, but at the same time docile and temperate. A slow, lazy horse is as objectionable and disagreeable to ride as a hot, irritable one. The latter will sometimes go quietly and temperately in the hands of a lady, though irritable and fidgety when ridden by men, owing to the easier, lighter pull on their mouths. From the position of the ladies' seat and from the great length and incumbrance of the habit, it follows they can not have the same power and control over the horse that men have, and accidents to them are more likely to be attended with dangerous results; hence, greater care is necessary in selecting a horse for their use free from all tricks, nervousness, and vice.

Many are called good ladies' horses that have no other recommendation than their being very quiet, which with very many will cover a multitude of faults.

A few years since ladies rode no pace but the walk and canter, but lately the trot has become a favorite and fashionable pace; consequently a safe, sharp, easy trot is now essential in all horses that are to carry a lady.

The ladies' hunter differs in some respects from the riding horse for the road or park; he may be less showy and stronger. He must be eight or nine years old, have been well and regularly ridden in hunts for at least two or three seasons, and thoroughly understand his business; not less than 15 hands 2 inches or more than 16 hands high, well above the weight he has to carry, well bred, and fast, but thoroughly quiet and temperate among other horses and at his fences, which he should take freely and cleverly, go well in the bridle without pulling, and turn readily with a motion of the hand.

A hot, irritable, fretful brute, or one with a weak, loose neck, is uncomfortable enough for a man to ride, but it is absolutely dangerous to allow any lady to ride such a one on the road—to say nothing of riding him to hounds—however good he may be represented to be.

The best colors for ladies' horses are bay, brown, dark chestnut, or black. There is an old saying, that "a good horse can not be a bad color"; and though no purchaser should decline, on account of color, to buy one that is likely to suit him, those named are to be preferred.

The price of horses differs so greatly, and depends so much on their make, style, and qualifications, that it is difficult to name an average one.

THE HUNTER

In selecting a hunter it is necessary to bear in mind the country in which he is to be ridden.

The points essential to a hunter are a lean head and neck, well set on to good oblique shoulders, a strong back and loin, wide hips, a deep body and back ribs, good muscular quarters, and gaskins well let down to the hocks, and clean, firm legs and feet. He must be temperate, with plenty of courage, and have a good mouth and manners. His size will vary from 15 hands 1 inch to 16 hands 2 inches, according to the weight he has to carry and the description of country he has to cross. From 15 hands 3 inches to 16 hands 2 inches is perhaps the best size for the flying grass countries, while from 15 hands 1 inch to 15 hands 3 inches will be found better and handier for the close deep country.

THE CARRIAGE HORSE

These horses are bought by the principal dealers and job-masters at three and four years old, and are broken, driven, and matched by them for some time before they are fit for the carriage. They must be fully 16 hands high, with rather long rainbow necks, strong but oblique shoulders, deep round body, with long muscular quarters, carrying a good tail, clean flat legs, and good firm feet. Being kept more for show than work, grand stylish appearance and action are indispensable; and from being generally loaded with flesh, unless the feet and legs are good, they will soon wear out.

The great defects to which carriage horses are liable, from their size and general formation, are—defect of the wind, either roaring or whistling; horses with long rainbow necks very frequently becoming so after a bad cold or an attack of influenza. All large horses, too, are more or less liable to their wind becoming affected after illness. Inflammation of the feet is another common complaint with horses of this class. Loaded with flesh to improve their style and appearance, and with high action in addition to their weight—two great causes of inflammatory attacks—they are very liable to this complaint, unless great care

is taken to guard against it. Many carriage horses, too, have flat feet, rendering them doubly liable to an attack of this description; in them the sole of the foot will sink, becoming convex instead of concave. When such is the case, great care is requisite in shoeing, or the horse will not be workably sound.

HORSES FOR LIGHT HARNESS

In this class may be included horses suitable for buggies, T-carts, light broughams, dog-carts, etc. They should be well-bred, neck rather long and arched, with good back and quarters, strong oblique shoulders, carry a good head and tail, and be of a generally showy and stylish appearance, with high grand action. Horses of this description are more fitted for the park and for show than for real work.

The cob is a strong little horse, about 14 hands high, and of various descriptions. When well-bred and good-looking, with action, they are not only very useful, but very valuable for carrying heavy and elderly men, as, being low, they are easy to get on and off. A good cob must have a good head, a strong but not heavy neck, good oblique and very strong shoulders, not loaded at the top or points, a deep round body, good loin, and strong muscular quarters and thighs—short, flat, firm legs, and good round feet; he should walk freely and well; step sharp and high in the trot, and canter safely and freely; if, in addition to these qualifications, he is quiet and does not shy or stumble, he is invaluable.

The faults to be avoided in purchasing a cob are upright shoulders, want of courage, and want of action. Particular attention must be paid to the shoulders—that they are well formed and oblique, many horses of this class having low, upright shoulders, which renders them valueless as riding cobs, and useful only for harness purposes—nothing being so uncomfortable and looking so ugly as riding on the top of the shoulders instead of well behind them, which must necessarily be the case with straight, low shoulders.

STABLE MANAGEMENT OF THE HORSE

In the morning the first thing the groom does on entering the stable, which must not be later than six o'clock, if the weather be warm and fine, will be to open the door and admit some fresh air; he will then give each horse a little water and a bit of hay; having eaten which, he will put on the hood and the watering-bridle, and take him out for exercise. While out, the helpers will separate the dry clean straw from the damp and soiled, removing the latter to the manure-heap. Thoroughly sweep and cleanse the floor of each stall and box, allowing the straw to remain turned up until the return of the horses, when it may be partly littered down again. Each horse will then have a feed of corn, and, having eaten it, be well dressed, and his stall or box set fair. When one groom only is kept, or where the horses do a fair amount of work during the day, early exercise is impossible and unnecessary.

In dressing the horse the first thing the groom does is to turn him round in his stall, fold the rug back from his neck and shoulders, then well and carefully brush his head, neck, and shoulders with the body-brush, cleaning it with the currycomb as often as required. He is then turned back in the stall, the clothing removed, and his body, hind-quarters, and legs undergo the same careful and thorough brushing, care being taken to keep the brush clean with frequent use of the currycomb. He is next wiped all over with a damp wisp made of hay-bands, which entirely removes any remaining dust, and after being well wiped over with a linen rubber or wash-leather, his clothes are put on and secured by the roller. His eyes, nose, and anus are next sponged clean, his mane and tail carefully combed or brushed, first with a dry and then with a damp brush; the feet are carefully picked out and washed, the legs well brushed, and if dirty or stained, well washed, and either rubbed dry or dried in flannel bandages. The stall is then set fair, and the horse is ready for use.

With gray or light-colored horses, or that have white legs, the better plan will be to wash all stains off the quarters, etc., and to wash the legs with warm water and soap, rubbing the first dry and well bandaging the latter before proceeding to dress the horse, as by the time that operation is over the legs will be dry and the horse warm and comfortable.

In the spring and autumn, when the horse is shedding his coat and the hair is broken and thin, the body-brush must be laid aside, the wisp and rubber being then quite sufficient for the necessary dressing.

Before having the harness put on to go out, the horse must again be wiped over, his mane and tail brushed, and his hoofs rubbed round with the oil-brush. Some people object to the use of the oil-brush to

the feet, and only have them done round with a wet brush.

On returning to the stable after work, if he be clean and dry, his feet should be well picked out and washed, and he should again be well dressed and set fair. But if he return hot and tired and wet and dirty, the best and quickest plan is to wash him all over with tepid water, scraping him immediately as dry as possible, clothing him up, and bandaging his legs above his knees and hocks with flannel bandages. If the weather be warm, he may be washed in the open air, and a light suit of clothes put on, to be replaced by fresh as soon as he is dry; but in winter, and if it be cold, he must be washed in the stable, and a suit of warm clothing put on until he is dry, when it must be changed. By this means the horse will be got fresh and comfortable in a much shorter time and with less fatigue to himself than if the dirt and sweat were removed in any other way and he was rubbed dry.

At seven o'clock, the horses that have not been out or done but little work may again have their clothing removed and be wiped over, which must not be done when the horse is tired with work and has been once made fresh.

FEEDING

It is as difficult to lay down general rules for the feeding of horses as it would be to make one set of dietetic rules apply to all classes of human beings. The animal's size, health, and amount of work must all be considered, and much depends upon the intelligence of the groom. A large horse heavily worked should have from nine to twelve quarts of oats daily, divided into three meals. A smaller horse, used for light buggy or saddle work, should do well on six quarts. Feed hay morning and night, observing how many pounds the horse appears to need. A mash made of five or six quarts of bran and boiling water, and well salted, should be given in place of the evening oats every fortnight or so. Corn should also be given from time to time in place of oats.

Turning out to grass is useful when the health is injured by long-continued hard work and dry food, or when the legs are sore or the feet inflamed.

EXERCISE AND WORK

Unless the weather is wet and bad, every horse, whether in a stall or box, is better for going out every day.

The work of a carriage horse does not on an average exceed seven or eight miles. They are very often out for three or four hours in the day, but by far the greater part of the time they are standing about, while the occupants of the carriage are either shopping or making calls, etc. From their size and weight they are generally unfit for long journeys and hard work.

The work of a hunter is to carry a man to hounds, and in order to render him fit to do so safely and well, he will require a great deal of exercise.

Before the commencement of the hunting season he will require three hours' steady walking and trotting exercise, with occasional sweats and strong gallops; but afterward, supposing he is ridden to hounds three days a fortnight, he will require but little fast exercise—from two to three hours a day good steady walking will keep most horses quite fit.

The fair average day's work for a hack or harness horse is nine or ten miles, in which case exercise is quite unnecessary. More harm and injury are done to horses by the grooms when at exercise than in any other way; and unless the man can be fully depended upon, the less they are exercised the better. Where the horse is only occasionally worked, exercise is of course absolutely necessary, not only to preserve him in health, but to keep him steady and from getting above himself.

CLIPPING OR SINGEING

The best time to clip or singe a horse must depend principally upon the state of his coat. Some shed their coat much earlier than others, while in other horses it is much thicker and coarser. About the end of September is the best time for singeing, and three weeks or a month later for clipping.

Clipping requires much practice and very neat work to look well; it is far more difficult than singeing, and consequently is not so frequently used. The effect of both is the same—to shorten the long rough winter coat to the length of the short summer one, thereby preventing that extreme sweating which is always consequent on a long winter coat. It is performed with scissors and a comb. The former are generally curved, and of various sizes, to suit the different parts of the body of the horse for which they are used.

Singeing is performed with a lamp made for the purpose, burning naphtha or some spirit of the same description, and which is passed lightly over the whole body till the

hair is reduced to the required length. It may be commenced as soon as the winter coat is partly grown, and must be repeated about every ten days or a fortnight till the coat is set and done growing, by which means the coat will not only be kept short, but the hair will better retain the natural color. After Christmas, about once in three weeks will generally be found sufficient to keep down the long rough hairs.

MANAGEMENT OF THE FEET

This department of stable management is often sadly neglected by the groom, who is particular enough in every other respect; but if his master is only a judge of skin and condition, he is too apt to leave the feet to take care of themselves.

An examination of the shoes should be carefully made every morning when the horse comes in from exercise; and if they are at all loose, or the clenches are too high, or the shoes are worn out, they should be renewed or removed at once.

Every night the feet should be well brushed out and the picker run round the shoe. If the horn is hard and dry, the feet should be stopped with cow-dung and tar, in the proportion of 3 to 1, called "stopping," which ought always to be kept by the groom in a box for the purpose, called the "stopping-box"; but it is seldom necessary to do this more than once or twice a week; indeed, in most feet it will soften the horn too much if used more frequently.

STABLE VICES

Stable vices may be considered to include the following long list of offences against the code of laws made for the stabled horse, and enforced by the stablemen. They are: 1, Getting loose from the head-stall; 2, Hanging back; 3, Leaping into the manger; 4, Turning round in the stall; 5, Lying under the manger; 6, Halter-casting; 7, Casting in the stall; 8, Kicking the stall-post; 9, Weaving; 10, Pawing; 11, Eating the litter; 12, Kicking at man; 13, Biting; 14, Crib-biting; 15, Wind-sucking.

Hanging back in the collar is an attempt to get free by bursting the throat-lash or collar-rein, and in some cases great force is applied in this way—so much so that many horses have broken their hips from the sudden giving way of the halter, letting them back so that they fall over and injure themselves irremediably. The only cure is a strong chain and a head-stall that no force will break, after trying to burst which a few times, the horse will almost always desist. If the manger is not very firmly placed, another ring should be fixed in the wall by piercing it and screwing a nut on at the back. The groom should likewise watch for the attempt, and well flog the horse from behind immediately he sees him beginning.

DEFECTS, DISEASES, AND FAULTS

A loose, weak neck.—Horses so formed are extremely unpleasant to ride; they get their heads up, can not see where they are going, and it is impossible to feel their mouths.

Twisted fore-legs.—Horses with this defect, when put to work, hit the inside of the fetlock joint, and very often under the knee as well. Both are highly dangerous, as the parts soon become swelled and sore from repeated blows, rendering the horse liable to fall.

Capped hocks are very unsightly, but seldom cause lameness.

Diseased eyes, from any cause, are sure to terminate in blindness.

Stringhalt.—Catching up one or both the hind-legs. When considerable, it renders the horse very unpleasant either to ride or drive.

All bony enlargements of the joints, viz., spavin, ringbone, sidebones, etc., as causing lameness, very difficult and doubtful of cure.

Laminitis, or inflammation of the laminæ, generally resulting in pumiced or convex soles of the feet.

Corns, unless small, as, if not properly treated, they are very troublesome, often causing temporary lameness, and rendering the horse cramped in his action, and liable to fall.

Chronic cough.—Frequently terminates in broken wind.

Megrims.—An attack of giddiness, more or less violent, that frequently attacks some horses, rendering them for the time highly dangerous. Since condition has been better understood, and horses are fed more on manger food and do not have so much hay, megrims are not so common as formerly. Fast, free horses are more liable to it than others. The cause is supposed to be determination of blood to the head.

Navicular disease.—Lameness in the navicular joint, and incurable.

An unnerved horse, as showing the horse's feet are diseased. Many unnerved horses will with care do a great deal of work

either on the road or in the field. It is a merciful operation by which many horses can work and move about with ease and comfort, that must otherwise have been destroyed, or live in pain and misery to the end of their days.

Roaring.—A disease of the respiratory organs, causing the horse to make a noise when put to any exertion.

All enlargements of sinews and tendons, arising from breaking down or violent strains, unless the horse has been properly fired for them, and is intended only for light, easy work, which he may stand.

All horses that show any sort of vice, as rearing, kicking, running away, being restive, and shying badly, or are vicious in the stable. Such animals are highly dangerous to all, but particularly so to the inexperienced.

TRICKS AND VICES

Kicking is a dangerous, vicious habit. Like rearing, it may be cured by those who thoroughly understand horses; but even when perfectly quiet and manageable in their hands, such horses are never to be trusted with less experienced persons.

Running away is another very dangerous fault. It may arise from vice or from the horse having been at some time seriously alarmed. In the former case, a very sharp bit and great care may prevent it; but in the latter, when the horse again becomes alarmed, nothing will stop him, as he is for the time in a state of madness.

Bucking or Plunging is another dangerous habit. Sometimes it arises from vice and sometimes only from freshness, the horse being above himself from want of work; in the latter case it is soon cured by putting him to daily steady work.

Jibbing, either in saddle or harness, is a very dangerous vice, and is always the result of bad temper. In saddle the horse rears, kicks, and rubs the rider against anything in his way. He will go anywhere and rush anywhere but in the direction in which he is wanted to go. A good thrashing will sometimes cure him, but it is not always easy to do it, as the horse invariably jibs in the most awkward and perilous places in which to fight him. In harness the jibber will not start, he runs back, and if whipped or punished, will plunge and throw himself down. Such animals are quite unfitted for private use.

Shying.—This bad habit may arise from timidity, defective eyesight, or bad temper. If from timidity, it can only be overcome by gentle usage and allowing the horse to pass the object without taking any notice of his fear beyond patting and encouraging him; to chastise him is worse than useless and senseless. If it arise from defective vision, it will be incurable, as it will be impossible for the animal to see objects otherwise than through a distorted medium. If it arise from vice, which is frequently the case, the horse must be made firmly but temperately to pass the object at which he shies; having passed it, continue the ride; do not return and pass it again and again, as that only irritates him; and when he finds he is mastered, he will daily improve.

HARNESS FOR SADDLE HORSES

This consists of saddles, bridles, breastplates, and martingales.

Saddles may be had of almost any size and weight. They may be made with either plain or padded flaps, according to the seat and fancy of the rider. Some prefer the former, and others the latter. For the generality of riders there can not be a doubt that the padded flaps are by far the better, as they keep the knee more steadily in the proper place, prevent the leg flying backward and forward, if the horse jumps or plunges, while in hunting they are of very material assistance in taking a drop jump, and also in steadying and recovering a horse when blundering or falling at a fence. The plain flaps have perhaps a smarter appearance, and a clever horseman may be able to ride as well on them as on the padded flaps, but that is almost all that can be said for them.

The saddle should be of sufficient length and breadth that the weight of the rider may be pretty equally distributed over it, or the back of the horse will suffer and saddle-galls be the result.

The stirrups should not be small, for, in the event of a fall, the foot is more likely to hang in them. All well-made saddles have spring bars, which should be occasionally oiled, that they may work easily, and release the stirrup-leather should such an accident occur. The stirrup-leather should be of the best, close and strong, and not too heavy, or it will look clumsy.

Every saddle requires two girths—which may either be of the ordinary kind of the same width, with a buckle at each end, or one broad, with two buckles at each end, which is put on first, and a second, about half the width only, over it, with one buckle at each end.

After use, the lining of the saddle must be thoroughly dried in the sun or before the fire, and then well brushed, which will keep it soft and clean.

This is particularly necessary with side-saddles. It is for want of this care and attention that so many horses have sore backs. When dirty, the saddle must be sponged clean, but not made more wet than is absolutely necessary; after which a little soft soap rubbed on will preserve the leather soft and pliable, and prevent its cracking.

In choosing a saddle, go to a first-rate maker; he may be a little more expensive, but you will get a good article, that will wear three times as long as an inferior one, will fit the generality of horses, will never get out of form, and will look well to the last.

The Breast-plate or Hunting-plate is used to keep the saddle in its place when hunting. It is also of great service on horses with short back-ribs, to prevent the saddle working back, which it is very likely to do. But on the road and in the field no lady should ride without one, as it will keep the side-saddle securely in its place, and prevent its turning round should the girth get loosened or break.

The Martingale is used to steady the horse's head, and keep it in its proper place.

It is generally used on loose weak-necked horses, and though of service in the hands of the experienced, it is often dangerous when used by others, as being apt to catch on the bit or buckles of the bridle, and so cause serious accidents.

The Bridle.—There is a great variety of bits suitable for different descriptions and tempers of horses, but it is impossible to describe them all in so limited a space. They all belong to one of two classes—the snaffle or the curb, and are of different degrees of severity and power.

The Snaffle is a piece of steel with a joint in the middle; it may be smooth and plain, twisted, or double-jointed. The smooth snaffle is the mildest form of bit there is, and, except just for exercise, few horses ride pleasantly in one. The twisted bit is sharper, and if drawn quickly backward and forward through the mouth, is very punishing. The double-jointed is the most severe; it is formed of two plain snaffles one above the other; but the joints in each not being opposite each other, cause a sharper and more narrow pressure on the tongue and lower jaw. Very few horses ride well and pleasantly in a snaffle of any kind, as they all cause a horse to raise his head and open his mouth to take the pressure off his tongue. In addition to this there are the Chain-snaffle, which is a very light bit, and the Gag, used for horses that get their heads down.

The Curb-bit is a lever that, by means of a curb-chain, acts upon the lower jaw, and may be made very easy or very severe, according to the length of cheek or leverage, and the height of the port or arch in the centre of the mouthpiece. It is very seldom used singly, but in conjunction with some kind of snaffle, when it forms a double-rein bridle, and is by far the most useful bit. All horses go better in it, when properly handled, than in any other; as by lengthening or shortening the curb-chain, and taking up or dropping the bit in the mouth, it can be made either less or more severe, to suit most horses.

The Pelham is a curb and snaffle in one; it is a curb-bit with a joint in the middle, instead of a port. It forms a double-rein bridle, and is very light and easy.

Like saddles, the bridles should be of first-rate material and workmanship; the bits sewn on to the headpieces and reins, as being much neater and lighter than the buckles. The leather must be kept clean and pliable with soft soap, and the bits clean and bright with silver-sand and oil.

HARNESSING AND PUTTING-TO

Harnessing.—In all cases, the first thing to be done, after the horse is dressed, is to put on the collar, which is effected by turning the horse round in his stall, and slipping it over his head, with the large end upward. This inversion is required because the front of the head is the widest part, and is in this way adapted to the widest part of the collar, which, even with this arrangement, will in coarsely bred horses hardly pass over the cheek-bones. Before the collar is put in its place, the hames are put on and buckled; for if this were delayed until after it had been reversed, they would have to be held on while the hame-straps were being drawn together, whereas in this way their own weight keeps them in place. They are now reversed altogether, and the pad put in its place, before buckling the belly-band, of which the crupper is slipped over the tail by doubling up all the hair, grasping it carefully in the left hand while the right adapts the crupper. A careful examination should always be made that no hairs are left under it, for if they are they irritate

the skin, and often cause a fit of kicking. After the crupper is set right the pad is drawn forward, and its belly-band buckled up pretty tightly; the bridle is now put on, and the curb-chain properly applied; the reins being slipped through the terrets and buckled on both sides, if for single harness, or on the outside only if for double, and the driving-rein folded back and tied in the pad terret.

Putting-to is managed very differently, according to whether the horse is going in shafts or with a pole. If for shafts, they are tilted up and held there by one person, while the other backs the horse until he is under them, when they are dropped down, and the tugs slipped under or over the ends of the shafts, according to the formation of the tugs, some being hooks and others merely leather loops. Care must be taken that they do not slip beyond the pins on the shafts. The traces are now attached to the drawing-bar, the breechen or kicking-strap buckled, and the false belly-band buckled up pretty tightly, so as to keep the shafts steady. In four-wheeled carriages it should be left tolerably loose when a breechen is used, to allow of this having free play. The reins are now untwisted from the terret, and the horse is put-to. For double harness, the first thing is to bring the horse round by the side of the pole, and put the pole-piece through the sliding ring of the hames, the groom holding it, or else buckling it at the longest hole while the traces are being put-to; as soon as this is done, the pole-piece is buckled up to its proper length, each coupling-rein buckled to the opposite horse's bit, the driving-reins untwisted from the terret, and the two buckled together, and the horses are ready. The leaders of a tandem or four-in-hand are easily attached, and their reins are passed through the rings on the head of the wheelers, and through the upper half of the pad terret.

Unharnessing is exactly the reverse of the above, everything being undone exactly in the same order in which it was done. The chief errors in either are—in double harness, in not attaching the pole-pieces at once in putting-to, or in unbuckling it altogether too soon, by which the horse is at liberty to get back upon the bars, and then often does considerable damage by his kicking.

ORDINARY DRUGS, AND THEIR ADMINISTRATION

FORMS IN WHICH THEY ARE PRESCRIBED

ALTERATIVES

ALTERATIVES are intended to produce a fresh and healthy action, instead of the previously disordered function. The precise mode of action is not well understood, and it is only by the results that the utility of these medicines is recognized:

(1.) Stinking hellebore, 5 to 8 grs.; powdered rhubarb, 2 to 4 grs. Mix, and form into a pill, to be given every night.

(2.) In Disordered States of the Skin.—Emetic tartar, 5 oz.; powdered ginger, 3 oz.; opium, 1 oz. Syrup enough to form 16 balls; one to be given every night.

(3.) Simply Cooling.—Barbadoes aloes, 1 oz.; castile soap, 1½ oz.; ginger, ½ oz. Syrup enough to form 6 balls; one to be given every morning.

(4.) In Strangles.—Barbadoes aloes, 1 oz.; emetic tartar, 2 drms.; castile soap, 2 drms. Mix.

(5.) Alterative Ball for General Use.—Black sulphuret of antimony, 2 to 4 drms.; sulphur, 2 drms.; nitre, 2 drms. Linseed meal and water enough to form a ball.

(6.) For Generally Defective Secretions.—Flowers of sulphur, 6 oz.; emetic tartar, 5 to 8 drms.; corrosive sublimate, 10 grs. Linseed meal mixed with hot water, enough to form six balls, one of which may be given two or three times a week.

(7.) In Debility of Stomach.—Calomel, 1 scruple; aloes, 1 drm.; cascarilla, gentian, and ginger, of each in powder, 1 drm.; castile soap, 3 drms. Syrup enough to make a ball, which may be given twice a week, or every other night.

ANODYNES

Anodyne medicines are given either to soothe the general nervous system, or to stop diarrhœa; or sometimes to relieve spasm, as in colic or tetanus. Opium is the chief anodyne used in veterinary medicine, and it may be employed in very large doses.

(1.) In Colic.—Powdered opium, ½ to 2 drms.; castile soap and camphor, of each 2 drms.; ginger, 1½ drms. Make into a ball with liquorice powder and treacle, and give

every hour while the pain lasts. It should be kept in a bottle or bladder.

(2.) Anodyne Ball (ordinary).—Opium, ½ to 1 drm.; castile soap, 2 to 4 drms.; ginger, 1 to 2 drms.; powdered aniseed, ½ to 1 oz.; oil of caraway seeds, ½ drm. Syrup enough to form a ball, to be dissolved in a half-pint of warm ale, and given as a drench.

(3.) Anodyne Drench in Superpurgation, or Ordinary Diarrhœa.—Gum arabic, 2 oz.; boiling water, 1 pint; dissolve, and then add oil of peppermint, 25 drops; tincture of opium, ½ oz. Mix, and give night and morning, if necessary.

(4.) In Chronic Diarrhœa.—Powdered chalk and gum arabic, of each 1 oz.; tincture of opium, ½ oz.; peppermint water, 10 oz. Mix, and give night and morning.

ANTISPASMODIC

Antispasmodics, as their name implies, are medicines which are intended to counteract excessive muscular action, called *spasm*, or, in the limbs, *cramp*. This deranged condition depends upon a variety of causes, which are generally of an irritating nature; and its successful treatment will often depend upon the employment of remedies calculated to remove the cause, rather than directly to relieve the effect. It therefore follows that, in many cases, the medicines most successful in removing spasm will be derived from widely separate divisions of the *materia medica*, such as aperients, anodynes, alteratives, stimulants, and tonics. It is useless to attempt to give many formulas for their exhibition; but there are one or two medicines which exercise a peculiar control over spasm, and we shall give them without attempting to analyze their mode of operation.

(1.) For Colic.—Spirits of turpentine, 3 oz.; tincture of opium, 1 oz. Mix with a pint of warm ale, and give as a drench.

(2.) Spirits of turpentine, 3½ oz.; tincture of opium, 1½ oz.; Barbadoes aloes, 1 oz. Powder the aloes, and dissolve in warm water; then add the other ingredients, and give as a drench.

(3.) Clyster in Colic.—Spirits of turpentine, 6 oz.; aloes, 2 drms. Dissolve in 3 quarts of warm water, and stir the turpentine well into it.

(4.) Antispasmodic Drench.—Gin, 4 to 6 oz.; tincture of capsicum, 2 drms.; tincture of opium, 3 drms.; warm water, 1½ pint. Mix, and give as a drench, *when there is no inflammation.*

APERIENTS

Aperients, or physics, are those medicines which quicken or increase the evacuations from the bowels, varying, however, a good deal in their mode of operation. Some act merely by exciting the muscular coat of the bowels to contract; others cause an immense watery discharge, which, as it were, washes out the bowels; while a third set combine the action of the two. The various purges also act upon different parts of the canal, some stimulating the small intestines, while others pass through them without affecting them, and only act upon the large bowels; and others, again, act upon the whole canal. There is a third point of difference in purges, depending upon their influencing the liver in addition, which mercurial purgatives certainly do, as well as rhubarb and some others, and which effect is partly due to their absorption into the circulation, so that they may be made to act, by injecting into the veins, as strongly as by actual swallowing, and their subsequent passage into the bowels. Purgatives are likewise classed, according to the *degree* of their effect, into laxatives, acting mildly, and drastic purges, acting severely.

(1.) Ordinary Physic Balls.—Barbadoes aloes, 3 to 8 drms.; hard soap, 4 drms.; ginger, 1 drm. Dissolve in as small a quantity of boiling water as will suffice; then slowly evaporate to the proper consistence, by which means griping is avoided.

(2.) A Warmer Physic Ball.—Barbadoes aloes, 3 to 8 drms.; carbonate of soda, ½ drm.; aromatic powder, 1 drm.; oil of caraway, 12 drops. Dissolve as above, and then add the oil.

(3.) Gently Laxative Ball.—Barbadoes aloes, 3 to 5 drms.; rhubarb powder, 1 to 2 drms.; ginger, 2 drms.; oil of caraway, 15 drops. Mix, and form into a ball, as in No. 1.

(4.) Stomachic Laxative Balls, for Washy Horses.—Barbadoes aloes, 3 drms.; rhubarb, 2 drms.; ginger and cascarilla powder, of each 1 drm.; oil of caraway, 15 drops; carbonate of soda, 1½ drms. Dissolve the aloes as in No. 1, and then add the other ingredients.

(5.) Purging Balls, with Calomel.—Barbadoes aloes, 3 to 6 drms.; calomel, ½ to 1 drm.; rhubarb, 1 to 2 drms.; ginger, ½ to 1 drm.; castile soap, 2 drms. Mix as in No. 1.

(6.) Laxative Drench.—Barbadoes aloes, 3 to 4 drms.; canella alba, 1 to 2 drms.; salt of tartar, 1 drm.; mint water, 8 oz. Mix.

(7.) Another Laxative Drench.—Castor oil, 3 to 6 oz.; Barbadoes aloes, 3 to 5 drms.; carbonate of soda, 2 drms.; mint water, 8 oz. Mix, by dissolving the aloes in the mint water, by the aid of heat, and then adding the other ingredients.

(8.) A Mild Opening Drench. — Castor oil, 4 oz.; Epsom salts, 3 to 5 oz.; gruel, 2 pints. Mix.

(9.) A Very Mild Laxative.—Castor oil and linseed oil, 4 oz. of each; warm water, or gruel, 1 pint. Mix.

(10.) Used in the Staggers.—Barbadoes aloes, 6 drms.; common salt, 6 oz.; flour of mustard, 1 oz.; water, 2 pints. Mix.

(11.) A Gently Cooling Drench in Slight Attacks of Cold.—Epsom salts, 6 to 8 oz.; whey, 2 pints. Mix.

(12.) Purgative Clyster.—Common salt, 4 to 8 oz.; warm water, 8 to 16 pints.

ASTRINGENTS

Astringents are supposed to produce contraction in all living animal tissues with which they come in contact, whether in the interior or exterior of the body, and whether immediately applied or taken by absorption into the circulation. But great doubt exists as to the exact mode in which they act; and, as in many other cases, we are obliged to content ourselves with their effects, and to prescribe them empirically. They are divided into astringents administered by the mouth, and those applied locally to external ulcerated or wounded surfaces.

(1.) Astringent Wash for the Eyes.—Sulphate of zinc, 5 to 8 grs.; water, 2 oz. Mix.

(2.) Goulard extract, 1 drm.; water, 1 oz. Mix.

(3.) Astringent Remedies for the Horse. For Bloody Urine.—Powdered catechu, ½ oz.; alum, ½ oz.; cascarilla bark in powder, 1 to 2 drms. Licorice powder and treacle, enough to form a ball, to be given twice a day.

(4.) For Diabetes.—Opium, ½ drm.; ginger powdered, 2 drms.; oak bark powdered, 1 oz.; alum, as much as the tea will dissolve; camomile tea, 1 pint. Mix for drench.

(5.) External Astringent Powder for Ulcerated Surfaces.—Powdered alum, 4 oz.; Armenian bole, 1 oz.

(6.) White vitriol, 4 oz.; oxide of zinc, 1 oz. Mix.

(7.) Astringent Lotion.—Goulard extract, 2 to 3 drms.; water, ½ pint.

(8.) Sulphate of copper, 1 to 2 drms.; water, ½ pint. Mix.

(9.) Astringent Ointment for Sore Heels.—Superacetate of lead, 1 drm.; lard, 1 oz. Mix.

(10.) Another for the same.—Nitrate of silver powdered, ½ drm.; goulard extract, 1 drm.; lard, 1 oz. Mix.

BLISTERS

Blisters are applications which inflame the skin, and cause watery bladders to form upon it; they consist of two kinds, one for the sake of counter-irritation, by which the original disease is lessened, in consequence of the establishment of this irritation at a short distance from it. The other, commonly called "Sweating" in veterinary surgery, by which a discharge is obtained from the vessels of the part itself, which are in that way relieved and unloaded; there is also a subsequent process of absorption in consequence of the peculiar stimulus applied.

BLISTERS FOR HORSES

(1.) Mild Blister Ointment (counter-irritant).—Hog's lard, 4 oz.; Venice turpentine, 1 oz.; powdered cantharides, 6 drms. Mix and spread.

(2.) Stronger Blister Ointment (counter-irritant).—Spirits of turpentine, 1 oz.; sulphuric acid, by measure, 2 drms. Mix carefully in an open place, and add hog's lard, 4 oz.; powdered cantharides, 1 oz. Mix and spread.

(3.) Very Strong Blister (counter-irritant).—Strong mercurial ointment, 4 oz.; oil of origanum, ½ oz.; finely powdered euphorbium, 3 drms.; powdered cantharides, ½ oz. Mix and spread.

(4.) Rapidly Acting Blister (counter-irritant).—Best flour of mustard, 8 oz., made into a paste with water. Add spirits of turpentine, 2 oz.; strong liquor of ammonia, 1 oz. This is to be well rubbed into the chest, belly, or back, in cases of acute inflammation.

(5.) Sweating Blister.—Strong mercurial ointment, 2 oz.; oil of origanum, 2 drms.; corrosive sublimate, 2 drms.; cantharides, powdered, 3 drms. Mix, and rub in with the hand.

(6.) Strong Sweating Blister, for Splints, Ring-Bones, Spavins, etc.—Red iodide of mercury, 1 to 1½ drms.; lard, 1 oz. To be well rubbed in the legs after cutting the hair short, and followed by the daily use of arnica, in the shape of a wash, as follows, which is to be painted on with a brush: tincture of arnica, 1 oz.; water, 12 to 15 oz. Mix.

(7.) Tincture of Iodine, which should be painted on with a brush daily, until it causes the cuticle to exfoliate. It may then be omitted for a few days, to be resumed after that interval.

CAUSTICS

Caustics are substances which burn away the living tissues of the body, by the decomposition of their elements. They are of two kinds, viz.—first, the actual cautery, consisting in the application of the burning iron, and called Firing; and, secondly, the potential cautery, by means of the powers of mineral caustics, such as potash, lunar-caustic, etc.

Firing is used extensively upon horses for inflammation of the legs. A set of firing-irons are heated to a great heat, and, one at a time, are lightly applied across the limb, or in lines up and down, according to the nature of the disease. This excites a very great amount of swelling and inflammation, by which the mischief is often abated, and is followed also by a contraction of the skin, which appears to act as a bandage in the weak state of the vessels of the legs, which often occurs. The firing is generally followed by blistering, in order to keep up the inflammation, and at least three months must be consumed before the fired horse, if thoroughly operated on, will be fit for work.

Strong solid caustics are as follows:

(1.) Fused Potass, difficult to manage, because it runs about in all directions, and little used in veterinary medicine.

(2.) Lunar-Caustic, or nitrate of silver, very valuable to the veterinary surgeon, and constantly used to apply to profuse granulations.

(3.) Sulphate of Copper, almost equally useful, but not so strong as lunar-caustic; it may be well rubbed in to all high granulations, as in broken knees, and similar growths.

(4.) Corrosive Sublimate in powder, which acts most energetically upon warty growths, but should be used with great care and discretion. It may safely be applied to small surfaces, but not without a regular practitioner to large ones. It should be washed off after remaining on a few minutes.

(5.) Yellow Orpiment, not so strong as the corrosive sublimate, and may be used with more freedom. It will generally remove warty growths, by picking off their heads and rubbing it in.

Strong liquid caustics:

(6.) Sulphuric Acid, or nitric acid, may be used either in full strength or diluted with an equal quantity of water; but it must be used with great caution, as it destroys the skin rapidly.

(7.) In Canker of the Foot.—Quicksilver, 1 oz.; nitric acid, 2 oz. Mix in an earthen vessel, and when cold put into a wide glass bottle, and cork it. It may be mixed with lard, in the proportion of 1 to 3.

(8.) A similar application, which may be used alternately with the last.—Copper filings, ½ oz.; nitric acid, 1 oz. Mix, and use in the same way.

(9.) Muriate of antimony, called butter of antimony; a strong but rather unmanageable caustic, and used either by itself or mixed with more or less water.

Mild solid caustics:

(10.) Verdigris, either in powder or mixed with lard as an ointment, in the proportion of 1 to 3.

(11.) Red precipitate, do., do.

(12.) Burned alum, used dry.

(13.) Powdered white sugar.

Mild liquid caustics:

(14.) Solution of nitrate of silver, 5 to 15 grains to the ounce of distilled water.

(15.) Solution of blue vitriol, of about double the above strength.

(16.) Chloride of zinc, 3 grains to the ounce of water.

CHARGES

Charges are adhesive plasters which while hot are spread on the legs, and at once covered with short tow, so as to form a strong and unyielding support while the horse is at grass.

(1.) Ordinary Charge.—Burgundy pitch, 4 oz.; Barbadoes tar, 6 oz.; beeswax, 2 oz.; red lead, 4 oz. The first three are to be melted together, and afterward the lead is to be added. The mixture is to be kept constantly stirred until sufficiently cold to be applied. If too stiff (which will depend upon the weather) it may be softened by the addition of a little lard or oil.

(2.) Arnica Charge.—Canada balsam, 2 oz.; powdered arnica leaves, ½ oz. The balsam to be melted and worked up with the leaves, adding spirits of turpentine if necessary. When thoroughly mixed, to be well rubbed into the whole leg in a thin layer, and to be covered over with the Charge No. 1, which will set on its outside and act as a bandage, while the arnica acts as a restorative to the weakened vessels. This is an excellent application.

CORDIALS

Cordials are medicines which act as warm, temporary stimulants, augmenting the strength and spirits when depressed, and often relieving an animal from the ill effects of over-exertion. They act much in the same way on the horse and dog, but require to be given in different doses.

(1.) Cordial Balls.—Powdered caraway seeds, 6 drms.; ginger, 2 drms.; oil of cloves, 20 drops. Treacle enough to make into a ball.

(2.) Powdered aniseed, 6 drms.; powdered cardamoms, 2 drms.; powdered cassia, 1 drm.; oil of caraway, 20 drops. Mix with treacle into a ball.

(3.) Cordial Drench.—A quart of good ale warmed and with plenty of grated ginger.

(4.) Cordial and Expectorant. — Powdered aniseed, ½ oz.; powdered squills, 1 drm.; powdered myrrh, 1½ drms.; Balsam of Peru, enough to form a ball.

(5.) Licorice powder, ½ oz.; gum ammoniacum, 3 drms.; balsam of Tolu, 1½ drms.; powdered squills, 1 drm. Linseed meal and boiling water, enough to form into a mass.

DEMULCENTS

Demulcents are medicines which are used in irritations of the bowels, kidneys, and bladder.

(1.) Demulcent Drench. — Gum arabic, ½ oz.; water 1 pint. The whole to be given.

(2.) Linseed, 4 oz.; water, 1 quart. Simmer till a strong and thick decoction is obtained, and give as above.

(3.) Marshmallow Drench. — Marshmallows, a double handful; water, 1 quart. Simmer as in No. 2, and use in the same way.

DIAPHORETICS

Diaphoretics are medicines which increase the insensible perspiration.

(1.) In Hide-Bound.—Emetic tartar, 1½ drms.; camphor, ½ drm.; ginger, 2 drms.; opium, ½ drm.; oil of caraway, 15 drops. Linseed meal and boiling water, to form a ball, which is to be given twice or thrice a week.

(2.) In Hide-Bound (but not so efficacious).—Antimonial powder, 2 drms.; ginger, 1 drm.; powdered caraway, 6 drms.; oil of aniseed, 20 drops. Mix as above.

These remedies require exercise in clothing to bring out their effects, after which the horse should be wisped till quite dry.

DIGESTIVES

Digestives are applications which promote suppuration, and the healing of wounds or ulcers.

(1.) Digestive Ointment. — Red precipitate, 2 oz.; Venice turpentine, 3 oz.; beeswax, 1 oz.; hog's lard, 4 oz. Melt the last three ingredients over a slow fire, and, when nearly cold, stir in the powder.

DIURETICS

Diuretics are medicines which promote the secretion and discharge of urine, the effect being produced in a different manner by different medicines; some acting directly upon the kidneys by sympathy with the stomach, while others are taken up by the blood-vessels, and in their elimination from the blood cause an extra secretion of the urine. In either case their effect is to diminish the watery part of the blood, and thus promote the absorption of fluid effused into any of the cavities, or into the cellular membrane, in the various forms of dropsy.

(1.) Stimulating Diuretic Ball for the Horse.—Powdered resin, sal prunelle, castile soap, of each 3 drms.; oil of juniper, 1 drm. Mix.

(2.) A More Cooling Diuretic Ball.—Powdered nitre, ½ to 1 oz.; camphor and oil of juniper, of each 1 drm.; soap, 3 drms. Mix, adding linseed meal enough to form a ball.

(3.) Diuretic Powder for a Mash.—Nitre, 6 drms.; camphor, 1½ drms. Mix.

(4.) Another More Active Powder.—Nitre, 6 drms.; camphor, 1½ drms. Mix.

EMBROCATIONS

Embrocations or liniments are stimulating or sedative external applications, intended to reduce the pain and inflammation of internal parts when rubbed into the skin with the hands.

(1.) Mustard Embrocation. — Best flour of mustard, 6 oz.; liquor of ammonia, 1½ oz.; oil of turpentine, 1½ oz. Mix with sufficient water to form a thin paste.

(2.) Stimulating Embrocation.—Camphor, ½ oz.; oil of turpentine and spirits of wine, of each 1 oz. Mix.

(3.) Sweating Embrocation for Windgalls, etc.—Strong mercurial ointment, 2 oz.; camphor, ½ oz.; oil of rosemary, 2 drms.; spirits of turpentine, 1 oz. Mix.

(4.) Another, but stronger.—Strong mercurial ointment, 2 oz.; oil of bay, 1 oz.; oil of origanum, ½ oz.; powdered cantharides ½ oz. Mix.

(5.) A Most Active Sweating Embrocation.—Red iodide of mercury, ½ to 1 drm.; powdered arnica leaves, 1 drm.; soap liniment, 2 oz. Mix.

(6.) This must be repeated until a blister is raised, which usually takes two or three applications. It may then be omitted for a week.

EMULSIONS

Emulsions are very useful in the chronic cough of the horse.

(1.) Simple Emulsion. — Linseed oil, 2 oz.; honey, 3 oz.; soft water, 1 pint; subcarbonate of potass, 1 drm. Dissolve the honey and potass in the water; then add the linseed oil by degrees in a large mortar, when it should assume a milky appearance. It may be given night and morning.

(2.) Another More Active Emulsion.—Simple emulsion, No. 1, 8 oz.; camphor, 1 drm.; opium in powder, ½ drm.; oil of aniseed, 30 drops. Rub the last three ingredients together in a mortar with some white sugar; then add the emulsion by degrees.

EXPECTORANTS

Expectorants excite or promote discharge of mucus from the lining membrane of the bronchial tubes, thereby relieving inflammation and allaying cough.

(1.) In Ordinary Cough Without Inflammation. — Gum ammoniacum, ½ oz.; powdered squills, 1 drm.; castile soap, 2 drms. Honey enough to form a ball.

(2.) In Old Standing Cough (Stomach). Assafœtida, 3 drms.; galbanum, 1 drm.; carbonate of ammonia, ½ drm.; ginger, 1½ drms. Honey enough to form a ball.

(3.) A Strong Expectorant Ball.—Emetic tartar, ½ drm.; calomel, 15 grs.; digitalis, ½ drm.; powdered squills, ½ drm. Linseed meal and water enough to form a ball, which is not to be repeated without great care.

FEBRIFUGES

Fever medicines are given to allay fever, which they do by increasing the secretions of urine and sweat, and also by reducing the action of the heart.

(1.) Fever Ball.—Nitre, 4 drms.; camphor, 1 dr.; calomel and opium, of each 1 scruple. Linseed meal and water enough to form a ball.

(2.) Another.—Emetic tartar, 1½ to 2 drms.; compound powder of tragacanth, 2 drms. Linseed meal as above.

(3.) Another.—Nitre, 1 oz.; camphor, 2 drms. Mix as above.

(4.) Cooling Mash.—Nitre, 1 oz.; may be given in a bran mash.

(5.) Cooling Drench. — Nitre, 1 oz.; sweet spirits of nitre, 2 oz.; tincture of digitalis, 2 drms.; whey, 1 pint.

CLYSTERS

Clysters are intended either to relieve obstructions or spasm of the bowels, and are of great use. They may, in the general way, be of warm water or gruel, of which some quarts will be required in colic. They should be thrown up with the proper syringe, provided with valves and a flexible tube.

(1.) Turpentine clyster in colic, see ANTISPASMODICS.

(2.) Aperient clysters, see APERIENTS.

(3.) Anodyne Clyster in Diarrhœa.—Starch, made as for washing, 1 quart; powdered opium, 2 drms. The opium is to be boiled in water, and added to the starch.

LOTIONS

Lotions are liquids applied to the external parts when inflamed, and they act by reducing the temperature, and by giving tone to the vessels of the part.

(1.) Cooling Lotion in Stiffness from Bruises or Work.—Tincture of arnica, 1 drm.; spirits of wine, 7 drms. Mix and rub well into the parts, before the fire, with the hand.

(2.) For Internal Canker. — Nitrate of silver, 10 grs.; distilled water, 1 oz. Mix, and drop in every night.

(3.) Cooling Lotion for External Inflammation.—Goulard extract, 1 oz.; vinegar, 2 oz.; spirits of wine, or gin, 3 oz.; water, 1½ pints. Mix, and apply with a calico bandage.

(4.) Another, Useful for Inflamed Legs or for Galled Shoulders or Back.—Sal ammoniac, 1 oz.; vinegar, 4 oz.; spirits of wine, 2 oz.; tincture of arnica, 2 drms.; water, ½ pint. Mix.

(5.) Lotion for Foul Ulcers.—Sulphate of copper, 1 oz.; nitric acid, ½ oz.; water, 8 to 12 oz.

OINTMENTS

Ointments are greasy applications, consisting of a powerful drug mixed with lard, or some similar substance, and thus applied to the sore; they are generally more properly described under the several heads for which they are used. (See ASTRINGENTS, ANODYNES, etc.)

STIMULANTS

By this term are understood those substances which excite the action of the whole nervous and vascular systems; almost all medicines are stimulants to some part or other; as, for instance, aperients, which stimulate the lining of the bowels, but to the general system are lowering. On the other hand, stimulants, so called, excite and raise the action of the brain and heart.

(1.) Old ale, 1 quart; carbonate of ammonia, ½ to 2 drms.; tincture of ginger, 4 drms. Mix, and give as a drench.

(2.) For other stimulants, see CORDIALS.

STOMACHICS

Stomachics are medicines given to improve the tone of the stomach when impaired by bad management or disease.

(1). Stomachic Ball.—Powdered gentian, ½ oz.; powdered ginger, 1½ drms.; carbonate of soda, 1 drm. Syrup to form ball.

(2.) Another.—Cascarilla powdered, 1 oz.; myrrh, 1½ drms.; castile soap, 1 drm. Mix, with syrup or treacle, into a ball.

(3.) Another.—Powdered colombo, ½ to 1 oz.; powdered cassia, 1 drm.; powdered rhubarb, 2 drms. Mix as in No. 2.

TONICS

Tonics augment the vigor of the whole body permanently, while stimulants only act for a short time. They are chiefly useful after low fever.

(1.) Tonic Ball.—Powdered yellow bark, 1 oz.; ginger, 2 drms.; carbonate of soda, ½ drm. Form into a ball with linseed meal and water.

Another.—Sulphate of iron, ½ oz.; extract of camomile, 1 oz. Mix, and form into a ball.

Another.—Arsenic, 10 grs.; ginger, 1 drm.; powdered aniseed, 1 oz.; compound powder of tragacanth, 2 drms.; syrup enough to form a ball. It is a very powerful tonic.

WORM MEDICINES

Worm medicines are given in order to expel worms, which they do partly from their specific action upon the worm itself, and partly by their purgative qualities, which all ought to possess, or to be followed by medicines of that class.

(1.) Calomel, 1 to 2 drms.; Barbadoes aloes, 3 to 6 drms.; ginger, 1 drm.; soap, 3 drms. Mix.

(2.) Worm Drench.—A pint of linseed oil every day.

CATTLE

THE Ox belongs to the order of Ruminants, or cud-chewers. It has hollow horns, which are directed sidewise, and then twine upward in form of a crescent; has a broad muzzle, low stature, and stout legs. It is also distinguished by a fold of skin which hangs beneath the neck, and is called the *dewlap*. The male and female of this species are respectively the Bull and the Cow. The young males are called Steers, and the females Heifers.

The problem of utilizing the ox to the greatest extent simply consists in producing, as quickly and economically as possible, an animal excelling to the highest degree both in the quantity and quality of its meat. Care, therefore, must be taken particularly to develop those parts which furnish the joints that are most esteemed.

VARIETIES OF DOMESTIC CATTLE

THE type of the ox best fitted for the butcher is that in which flesh surpasses bone in proportion, and in which the hinder parts are more fully developed even at the expense of the neck and shoulders; for the latter joints furnish an inferior article of food, so that their reduction, if compensated for by an increase of the more valuable portions, must be a great desideratum.

What, therefore, are the points by which we can discern when an ox approaches the butcher's ideal? The answer is, great width combined with depth and length.

"The deeper the animal is in the thorax, in proportion to its size, the closer it is to the ground, in vulgar terms; added to this, the longer it is in body and rump; and the thicker it is, or, as is commonly said, 'the better it is made up,' the greater amount of clear meat it gives in comparison with its absolute or living weight, and the better it approaches to the desired type."

There are certain accessory characteristics which must have their due importance, as likewise forming a prominent feature in the type of the ox which is intended for the butcher. It must have slenderly made bones, a fine head, skin supple and not too thick, moderate dewlap, thin and downy hair, calm visage, quiet and mild look. It may be regarded as a certainty that the ox which combines these and the former attributes possesses a special fitness for becoming good beef.

Next to meat, milk is the most valuable product with which this race furnishes us —a source of wealth to the producers, for it is an article of universal consumption. Thus it may be easily understood how important it is for the buyer to be able to distinguish, *à priori*, in the market, from certain outward signs, what are the milking qualities of a cow, and to be able to arrive at a correct conclusion, even in a heifer, whether she will be a good or bad milker.

There are both good and bad milkers in every race; the proportion, however, of each presents a certain constant character, by

which some breeds may be recognized as possessing a decided milking superiority. Climate and nature of pasturage have also great influence on the lacteous qualities of different races.

The principal breeds of oxen and cows are the Shorthorn, Hereford, and Devon; and besides these we have the Sussex, the Longhorned, the Galloway, the Angus, and the Kyloe.

The Shorthorn is now undoubtedly the dominant breed. Originating in Teeswater, and carefully bred years before the existence of any herd-book recording descent, it soon reached the highest reputation for its early precocity and meat-producing qualities.

The Herefords, another leading breed of cattle, characterized by red body and white or mottled face, come almost as early to maturity as the Shorthorn, and, attaining great weight, are certainly one of the best breeds. They have as great an antiquity as the Shorthorn. As much as $5,000 has been given for a Hereford bull and cow; and high prices are fetched still, though not so high as those of the Shorthorn stock, for well-bred bulls and cows.

The breed has now a herd-book of its own, and it is in the hands of as much enthusiasm and ability as has characterized the history of the Shorthorns. For early maturity and large size, accordingly, it now almost equals the Shorthorn; and for quality of meat it probably excels it.

The Devon.—The North Devon ox is a small animal, of a light red color, without any white, with long yellowish horns, and a well-made symmetrical frame. Hardy, light and active, it is an excellent worker, and is worked in harness until five or six years old, and then fattened.

The Sussex is a larger, coarser animal than the Devon, but otherwise resembles it.

The Longhorned, a dairy breed, rather than one adapted for the feeding-house, is gradually disappearing from English middle and western counties, where it prevailed.

The Kyloe, or West Highlander, adapted to the rough pastures of the districts where it is bred, is driven south to be fattened on English grazing-grounds, where it yields the very best of beef at four and five years old. It is characterized by long, upturned horns, a shaggy coat of a yellow, dun, or black color, and well-made, compact little body.

The Galloway, resembling a Kyloe without horns, with a less shaggy coat, is, when well-bred, one of the best-made and most symmetrical of English breeds of cattle. It, too, is driven south in large numbers to be fattened, and yields excellent beef.

The Angus, also a polled breed, of a red or black color, is a much larger animal, and when crossed with the pure-bred Shorthorn breed, furnishes one of the best crosses for the feeding-stall that we have.

Besides these, there are other sorts especially adapted to the dairy.

Different Kinds of Cows.—The large kinds of cows are generally chosen where there are rich fertile pastures; and no doubt the dominant breed throughout the country, both for indoor and outdoor feeding, is, as has been said, the Shorthorn. This breed is divided into several varieties—the Holderness, Northumberland, Durham, Yorkshire, etc. The Yorkshire is thought to be the best for the dairy. These fine animals appear to have descended from the Teeswater breed. There are a great many varieties of the large cows in England that have been bred by Shorthorn bulls. An excellent cross is common in the eastern counties between the best Suffolk cows and shorthorn animals of the best blood. They are good milkers, harmless, and very quiet, and consequently much approved of for pasture-feeding. Cows of this breed will produce from ten to twelve pounds of butter per week each, when well managed; and for butter dairying the quantity and quality of cream produced is of greater importance than the quantity of milk.

Cheshire Cows.—The Cheshire dairy farms are mostly stocked with a mixed breed of cows, between the Cheshire, Lancashire, and other crosses.

Lancashire.—The Lancashire are distinguished by their long horns, deep forequarters, and long hair. They, as well as other long-horned cows, are said to give richer milk than polled cows, but not so much of it. Besides the milking properties of a breed of cows, their hardy qualities must be thought of, where they are exposed to bleak situations; and no doubt the long-horned Lancashire and other coarse-skinned animals are the most hardy.

Devons.—The middle-horned breed of cows may include the Devons, the Herefords, and the Sussex. The two latter are the largest, but neither of them excel the best Shorthorn in their produce of milk. The Devons are of a light red color, with yellowish colored horns, well made, and their milk is rich—or there would not be such rich Devonshire cream.

Hereford.—The Hereford, next in size to

the Shorthorn breed, is a fine animal and a pretty good one for dairy stock, but better, perhaps, for fattening purposes. The Sussex do not differ much from the Herefords; they are both of a darker color than the Devons, with horns of a moderate length, turning up at the points, having wide hips and smallish bones. They are middling cows for the dairy.

Galloway.—The polled Galloways are very nice animals for grazing purposes; they are mostly black, well proportioned in form, and yield an average quantity of milk, when carefully used, for dairy purposes.

Highland.—The Highland are not thought to be better milk-producers than the Galloways, but more hardy.

Ayrshire.—The Ayrshire cow is a favorite in some places, but not preferred by cow-keepers in general. It is, however, a good animal for the dairy, and almost equal to the Alderney in the richness of its milk. It has fine wrinkled horns, is larger than the Alderney, and somewhat like it in appearance. Its color is usually red and white.

Shetland.—The Shetland cattle are very small, and inferior in shape to those of the Western Highlands. They are hardy, small consumers of food, and yield about two quarts of milk a day.

Welsh.—The Pembrokeshire cow is small and hardy. It is fine-boned, with clean light head and neck, small yellow horn, good chine, long round barrel, thin thigh, and short fine legs, always in good condition if tolerably kept, and has a rich wave in her hair which ever denotes thriftiness of kine. Its produce is from five to seven pounds of butter a week during the dairy season.

Irish.—The Kerry cattle, in size and shape, resemble some of those from the Western Islands, of a high-bred deer-like shape, not so broad or so low in the leg as the native Highland Scots. These cattle are very hardy, being reared in a country of rocks and hills. Their properties are said to be that of giving the largest quantity of milk, which is also of the richest quality for the amount of sustenance they require.

Alderney.—The little Alderney cow is a slender-made animal, not very well shaped, though admired for its deer-like mild face and fine bone; it is mostly of a red and white color, with a mottled face. The Alderney gives the richest milk of any kine, and some of them have been known to produce ten and eleven pounds of butter a week of the finest quality. They are rather tender, and require to be well housed in the winter.

Suffolk.—The Suffolk cow is believed to be the best of the polled breeds for the dairy where the pastures are not very rich. They are quiet, hardy, and suitable for upland fields.

It is thought that the Dun-colored originally descended from the Galloway; they do not, however, generally appear to be so uniformly well-shaped as the Galloway, although they have been vastly improved of late years by careful breeders. Various crosses between them and the Ayrshire, and other varieties, have increased the produce of the dairy in many places; but it is believed that for large dairies no cross is superior to that of the Suffolk cow and the Shorthorn bull.

Whichever breed is made choice of to improve the stock, both male and female should be of the best animals. By a first-class bull a hardy, well-formed, and abundant milk-producing cow is almost sure to produce valuable calves to bring up for the future supply of the dairy.

THE COW AND CALF

Rearing Cow Stock.—Where there is accommodation for rearing young cow stock, the best males and females should be selected for propagating a good breed. It would not do, however, for those who expect to make a profit by dairy-farming to purchase animals at the fabulous price of hundreds and thousands of dollars, such as we read of at the sales of first-class breeders. Very excellent animals can be found now of various breeds, and calves chosen from the best of them, though not very high in price, will be as good for dairy purposes as the most celebrated stock. A selection should be carefully made from mothers which are the best milkers, with full-size udders, wide rounded hips, straight backs, and broad chests, with small tapering legs; and bulls with broad breast, projecting a little before their legs, with neck rising from their shoulders, moderate-sized heads, flat, broad, straight backs, well filled up behind their shoulders and between their ribs and hips, with small straight legs and rounded bodies. Large sunken bodies are generally brought on by poor keep. Animals kept on straw and sedgy meadows only, while young, are usually disfigured by their bodies becoming unnaturally protruded.

Watchfulness required.—When cows are expected to calve (at the end of forty weeks) they should be carefully watched night and day, and where the weaning of

the calf is intended, it would be best for them to calve at the beginning of March, as they would then have the whole of the grass season before them. When the cow has had a protracted and difficult calving time, she will require careful treatment. In common natural cases she will soon be all right; but in difficult cases brushing of the belly and loins with a wisp is serviceable—gentle walking exercise for a short time in fine weather is useful. Gruels and cordial drinks should also occasionally be given. The latter might consist of a quart of ale mixed with sugar or treacle, and diluted with water, to be given warm. She must have her warm water mixed with a little meal. Should fever intervene, it is best to send for the veterinary surgeon, and commit the case to his care.

Cows after calving should be carefully fed with nutritious food, in small quantities often repeated; and it is certainly best to give cooked or boiled food, as it prevents more generally indigestion and flatulent colic. At all events, sweet and easily digested food should be given, or material injury may arise. Should the udder swell from excess of milk, or the incapacity of the calf to draw it all away, frequent milking is requisite, and it should be hand-rubbed well, with frequent washings of warm water and soft soap, or with warm bran-water. The teats occasionally become sore; the same applications should be resorted to, and, in addition, a little lard, olive-oil, or even cream, should be gently rubbed on, particularly in cases of pustules arising, or scab.

Calves will soon learn to drink from a pail; but it is generally thought best to allow them to suck from their mothers for a few days, while the herdsman milks on the opposite side. The cow will give down her milk the better for it, and become reconciled to his milking her without the calf afterward, if treated with gentle kindness.

The calf should have new milk for a fortnight twice a day; then skimmed milk mixed with oatmeal or linseed meal, boiled for half an hour, during another fortnight or three weeks. It will require about two gallons a day till it begins to eat well, which it will do when it is five or six weeks old, if some sweet hay be given it daily, or some hay chaff with pulped mangold or swedes mixed with it. Skimmed milk, or whey mixed with a little linseed meal, will then do for its drink,* which may be continued till it is twelve weeks old, when it will live very well on a pasture or on natural food. Some people wean calves almost entirely on linseed tea.

Summer Treatment.—When the weather is warm and the flies become troublesome, they ought not to be left in their pasture without shade or shelter. If well shaded during the heat of the day, and supplied with pure water and some green food in their cribs, they will most likely continue to thrive; but if left to be tormented with flies, huddled together in a corner of their pasture, or in a wet ditch, they will probably become unhealthy. It may here be remarked that, on first leaving the cow-house, the calf should be confined in a safe place in the yard or elsewhere for a day or two, until it becomes accustomed to the bright light of day, as on its first introduction it appears almost blind, and would be likely to run into danger.

A change of pasture now and then is desirable, but calves should not be put into low wet meadows, as it is generally in such situations that they get diseased with a husky cough. As the fall approaches the grass will be less nutritious; it will then be necessary to give them some food in their yard or shed, such as pulped roots mixed with cut straw chaff, every night. A little salt mixed with their chaff is a good thing, and is believed by some people to prevent "hove."

When frost begins they should not be turned into their pasture till nine or ten o'clock, or till it disappears. Their racks, cribs, and mangers, or whatever they feed or drink from, should constantly be kept clean, and the herdsman should be urged to feed and water them regularly, and to keep them well supplied with dry bedding.

As winter approaches they would be best confined to the yard and shed, where, if well sheltered and fed regularly with a proper quantity of pulped roots, turnips, or mangold, mixed with straw chaff sprinkled with a little salt, they will thrive fast enough till the spring, when they can return to their pastures, or be provided with green food; they should be carefully treated as before recommended. The upland pastures are best for young stock.

Some people allow heifers to have calves when only two years old, but they seldom (if ever) make such good cows as those that are left free till they are three years of age.

Young stock brought up as here recommended will generally thrive fast, and be free from disease.

* The milk may be taken from the quantity set up for butter and once skimmed after standing twelve hours.

Cost of Keep.—Cows are large consumers of food, and should not be stinted when in milk. Heifers will require nothing but green food in the dry summer months; but as the winter approaches they should be sheltered in a yard at night, and a little fresh barley or oat straw given them in their cribs; whenever the pastures become injured by frost, both young and old cows require improved food in their sheds. A few Swedish turnips or mangold roots should then be given them, which, if pulped and mixed with sweet chaff (one-fourth hay), would be sufficient to keep them in healthy condition; but this applies only to those that are not in milk. When within two months of calving, all cows should be dried, for, if not then dried, they will not produce so much milk the next year. They should afterward have their food improved by an additional weight of roots with their chaff, which should be mixed in a heap overnight. By the morning it will be found to have heated a little, which imparts a flavor that is much relished by the cows.

Consumption of Food.—As was before remarked, cows are large consumers of food, and it is no wonder that they should require an abundance, to enable them to supply so rich a sustenance for mankind, as well as to support themselves. Where there are no good dry pastures to provide them with plenty for their summer keep, they would do very well in a proper feeding-house (inclosed on the north and south sides) with a door at each end, if they were liberally supplied with green food, cut for them and put in racks: such as rye grass, clover, tares. It has been found that milk as abundant and butter quite as good have been produced by cows so fed, as by those which had the run of rich pastures. But where there are pastures it would be well to have the cows housed in hot weather, when insects are troublesome; or else they will be worried and heated and unable to feed, and will fall off in their produce of milk.

A large cow will consume a hundredweight of green food per day.

When green food is scarce, as is generally the case at the end of a dry summer, a little linseed-cake or bean-meal, mixed with cut chaff (one-third hay), should be given them to keep up the produce of milk, lest part of the best season for dairying should be lost by its failure.

It is not a good plan to feed cows on much uncut hay, for they would consume and spoil a hundredweight a day, if fed entirely on it. Much less expensive and more natural condiments can be made by a mixture of bean, barley, maize, or linseed-meal, and other produce of the soil by cow-keepers themselves.

Milk Dairies.—When cows are kept only for the purpose of producing a large quantity of milk, brewers' grains are given them, with a small portion of hay, for ruminating purposes. On this they do tolerably well, but it will be found to their advantage if about three or four pounds of bean-meal be mixed with the grains for each cow per day.

Winter Food.—In winter and spring, Swedish turnips, mangold, and other root crops would be found more economical food than the grains, meal, and hay last mentioned. A bushel of pulped roots mixed with about fourteen pounds of cut chaff (one-third hay), and given them twice a day, would be found sufficient to satisfy a moderate-sized cow, but they should not be stinted or confined to any quantity if they are found to require more. Cabbages, carrots, and parsnips are very good food for milch cows if given in moderate quantities with other food. It is important that all roots should be freed from earth before pulping, or given to the cows, otherwise it would impart an unpleasant flavor to the cream. When cows are fed on pulped roots, with cut chaff, a peck or two of malt-dust ("combs") would be a nice addition, as it would give a zest to the mixture. A sufficient quantity for the whole herd should be put into a heap about twelve hours before it would be wanted, when it would be found to have acquired a little warmth and a fragrant smell, which would give the cows a greater relish for it.

A change of green or succulent food appears to promote the secretions of the system, and to give stimulus to their action. Such as would injure the flavor of milk should be avoided. .White turnips and cabbages will do this, if given without a good supply of other food with them.

POULTRY

AMONG the important advances of recent times may be mentioned the elevation of agriculture in all its branches to the dignity of a science. Formerly the tilling of the soil and the raising of live-stock of various kinds were scarcely rated among skilled callings. Nearly any one with the inclination was supposed to be amply qualified for the business, and that good results were accomplished under such conditions was very greatly to the credit of the farmers themselves. Probably, also, the economic conditions of former times had much to do with the successes reaped by conservative methods.

At the present time the need of exact knowledge and careful training is nowhere more marked than in agriculture, and nowhere is such knowledge of greater utility than in the raising of domestic fowls for profit. The "college-bred farmer" may be a character who provokes ridicule in some minds, but his success is worthy the emulation of all. At any rate, the following scientific treatise on practical poultry-raising should convince would-be "fanciers" that there is a "scientific" way of making the poultry yard pay, and that it is, in a large number of respects, superior to the former method of allowing nature and chance to supplement, if they will, the deficiencies of our own knowledge of this important subject.

HOW TO KEEP POULTRY IN GOOD CONDITION

THE state of thriving prosperity in poultry so well known to connoisseurs as condition is of such primary importance that it may justly claim first attention.

When fowls get ill and die, without any apparent cause, careful observation may generally trace it to one or other of a few fertile sources of evil to them. They have been overcrowded, they have had too much pampering, or they have had too little care. All fatal faults in feeding come under one of the last two heads.

If the apparent health and appearance of the fowls be not satisfactory, visit the hen-house after it has been some hours shut up at night, and if the air be offensive there need be no further quest after the cause of illness or other evil there may be among the living beings breathing its close atmosphere for many hours.

The remedy should at once be applied by decreasing the number of fowls, and by giving increased ventilation.

A hen-house 6 or 8 feet square will do well for seven old fowls, or one large brood of chickens. More crowding will not lead to a good result; so if the increase of the stock seems to render it necessary, consider

means for housing the youngsters out of doors, in coops or by other contrivances, rather than overfill the houses.

Fowls, even the tallest, live and breathe very near the surface of the ground; and when the earth becomes foul from having had live stock on it for some time, they can not fail to inhale the malaria engendered by it. Human beings in such an atmosphere would fall in as great proportional numbers as do the fowls of the most unfortunate amateurs; sanitary measures in their case stop epidemics, and they are the remedies to use with our fowls, or we must not look to have them prosperous and healthy.

The most valuable sanitary measure for the fowls is to renew the surface of the runs by paring from time to time. Spring is a good time to do it, when the pared-off surface, rich with guano-like manure, is a valuable strong fertilizer. Duck and pigeon manure are the strongest.

Means must be taken to dry the runs, made pure by paring. Low damp ground should be drained. Excellent runs may be made by paring the ground one spit deep, *i.e.*, a foot, good measure, and filling in with a depth of nine inches of chalk and three of gravel.

Sometimes, when paring would be too troublesome, a sprinkle of lime over the surface will purify it, but the fowls should be kept off it until after rain. Where the fowls have extensive ranges the immediate neighborhood of the houses only will need this cleansing process; but the floors of the hen-houses require renewal from time to time.

The kind of pampering which leads to overfeeding fowls, giving them dainties, such as meat, greaves, hemp-seed, Indian corn, and other fattening food, and keeping them too warmly housed, is a fertile source of ill-health. Poultry, to remain thoroughly healthy, and not to become unhealthily fat, should never have a grain more of food given than they can eat up at once with a hungry, healthy appetite; they should not be fed too often, they should not have a variety of food given at the same time, and they should have to run for all the food they eat, and have it so thrown abroad that they shall have plenty of work, and consequently plenty of amusement, to find it.

The well-being of fowls requires that they have *regular* care as well as judicious economical feeding, regular meals, a regular supply of water, and regular cleaning. The real care that they require is not pampering and superabundant, almost incessant, feeding, and sometimes the less they are run after the better they will thrive; but the little care they need should be administered with regularity. This is the kind of care that will keep poultry in the perfect health and good looks which amateurs know so well, and so fully appreciate as good condition.

A fowl in good condition is free and bold in gait, brisk in movement, and bright in the eye. The plumage is full, firm, crisp, and glossy; the bird feels firm in handling; it is neither too lean nor too fat, and the comb is clear and bright in color, according to the season.

When a bird is out of condition, in which case it will do no good service to its owner, its flesh is flabby, however fat it may be; it is heavy and listless in movement, often craves continually for food, and seems too lazy to wander far to seek any for itself. The comb and eye lack brightness, but the plumage tells the tale most unmistakably; it is dull, ruffled, and broken, sets away from the body, and either comes out with a touch, or adheres to the skin with unnatural tenacity, fixed by a kind of leprous scurfiness. A tendency to roup is often seen.

ARRANGEMENT OF STOCK

The cheapest way to get up a stock, allowing time and work for the matter, is to buy really first-class reliable eggs, from sellers of established character. We must neither expect all the eggs to hatch, all the chickens which are hatched to turn out especially good, nor find fault with the seller if this be not the case; for if he is honest he will tell you that when eggs are set at home, without the no small trial of a journey, the hatching of two out of three is a pretty good proportion, and a first-class pair from each brood is ample return for the outlay, reckoning the value of the eggs at the usual price charged for eggs for setting, and the trouble of rearing.

If it be wished to get a good stock together, without the delay of rearing chickens, it may be done by purchasing fowls.

In-breeding, *i.e.*, breeding among relations, must be carefully avoided. However fine the stock, it is altogether against the laws of good breeding to keep the pullets and the cockerels, and go on year after year breeding from them without the in-

troduction of fresh blood. Doing so will produce decrease of size and weakly constitutions. In-breeding must, on no account, be carried beyond the first remove. The mother may be mated with her son, but the old game breeders did not consider the union of a rooster with the pullets bred from him nearly so good.

In the purchase of stock, therefore, take care to get hens and roosters which are not related, either by buying from different persons, or by asking the person of whom you purchase for roosters and hens of different families, which most amateurs, and all dealers, are able to manage.

It has not unfrequently happened that well-established, good stocks of fowls have been greatly injured by a carelessly introduced cross. When the introduction of fresh blood becomes necessary, the stock with which to cross should be chosen with reference to the qualities most wanted, and great care is necessary to prevent the increase of present failings by it. The purity of the breed and its stamina must also be especially considered; for mongrel crosses, or a weakly constitution, may be introduced in one year, and may take a great many to eradicate.

With regard to the number of hens to be allowed to run with one rooster, various opinions have been given; but while ten or a dozen may form one group for the production of eggs, for that of really fine chickens the number should be limited to four, or at most six. With four hens, almost all the eggs which are laid will prove productive of fine, strong chickens, provided, of course, the stock birds are good.

At the breeding season the breeding stock should most decidedly be confined to runs, if purity and precision in breeding be a desideratum; and each family, consisting of a male bird and his harem, should be kept distinct. This separation from stock birds less to be depended upon than those which are selected should be arranged before Christmas, and continue until eggs are no longer wanted for setting, after which they may have a fuller range, when the houses they have occupied will be valuable for other purposes.

So particular have some game breeders been in that important point, purity of race, that they considered that the character of the chickens might be influenced by the hen that hatched them, and would set eggs only under the hen that laid them, or one of the same breed, saying that roosters lost pluck by being hatched by common hens.

HOUSES

A simple construction is better for a hen-house than a very elaborate air-tight building; for too confined air, while the fowls are at roost, makes the place offensive, and is more prone to engender disease than almost anything.

Poultry amateurs would be much at a loss in their building operations if they could not have that useful commodity, the patent felt roofing. It measures 32 inches wide, and is a capital water-tight covering for a roof, or any other part of a hen-house; it is like wood and brickwork to the builder of hen-houses, and cheap withal.

About the cheapest regularly formed house may be made with it, stretched over a wooden frame, which should be rather stout, and well put together. The roof should be made of common boards, under the felt, which without that support is apt to bag, make hollows for water to lodge in, and become rotten in consequence. It nails most easily with iron tacks heated in a frying-pan; when up, it requires tarring and thickly sprinkling with sand, which should be repeated every year to make it durable. In sunny weather a felt house is apt to be hot, so that, to keep it refreshingly cool, as well as for appearance' sake, it is a good plan to plant quick-growing trees round it.

Tolerably stout wooden houses have done hundreds of amateurs excellent service. For the house to keep in good order, the wood should be well seasoned, and any amateur carpenter can put it up at small cost and trouble. Shape the house with a framework of battens. The lowest part may be five feet high, and the roof should have a good pitch, both to throw off the wet, and to make it airy. The cheapest description of boards will do for the roof under the felt, and scarcely any wooden roof is good without that covering, from its being liable, after being swelled with wet, to crack with the heat of the sun, and so let in water. If it be entirely of wood, the boards can either be placed horizontally, with an overlap of at least an inch and a half, or vertically, edge to edge, with fillets of wood nailed over the joints. A cheap roof, yet one which is tolerably lasting, may be made by covering the boards with gas tar and coarse brown paper. Lay

on a coat of tar, then the brown paper, lapping it over a full inch where the sheets meet, and finish with another coat of tar. When the wooden roof is to be covered with either felt or brown paper, there need be no overlap of the boards, but they may lie edge to edge, either from ridge to eaves, or across. The boards, too, for covering the framework of sides, back, and front of the house can go either upright or across, whichever will use the wood to the best economy. Eaves should project well, to carry off wet.

If the boards are used rough, three-quarter-inch planks will do, but if they are planed, inch deal will be required to make up for the waste.

A hatch for the fowls to go in and out, with a door to slip down over it, should be made when the house is built; sometimes two on different sides are found very useful, in case of changes in the run, which can then be put to one side of the house, instead of the other, without further alteration.

A more solid kind of house, as well as one which will be more costly, can be built with regular walls of brick, stone, rough stone, or earth. These may be more lasting, and the first three more secure from the attacks of vermin, but, of course, the cost both in material and labor will be greater.

For a brick wall, what bricklayers call half a brick thick is sufficient, as very great strength is not required. A pattern of a few feet square, made by leaving out alternate bricks high up on the side of the house, which will admit air that will not be too cold, is a good means of ventilation, and of giving light also.

Few amateurs would go to the expense of walls of hewn stone, but in neighborhoods where rough blasted rock or stone is plentiful, and consequently cheap, it makes good walls, which come rather cheaper than brickwork. To be sufficiently solid and stable these walls should be rather over than under a foot thick, and the stones fitted together with judgment, to avoid interstices causing weakness, or great consumption of mortar, of which, however well the stones may be fitted, a great deal will be used. While building this kind of wall it should be brought to a level of surface at the top every 16 inches or so, which gives the stone a look of order in the arrangement, greatly improving the appearance, and also giving strength. All laminated stone, *i.e.*, stone which has an appearance of being formed in layers, should have these layers placed horizontally.

Where building materials of most kinds are difficult to obtain, earth walls may be used with advantage, requiring, if the material be at hand, little outlay except labor. The proper earth is neither sand nor clay, but partaking of both. Clay, chalk, any calcareous earth, or sand, is bad for the purpose. The earlier in the season the building can be done the better, that it may have time to dry; but a time must be chosen when the earth is sufficiently dry for working, and the coarser and bolder it is the better. A foundation of brick or stone must be used, which can be brought 9 inches above the surface of the ground, or less if preferred. The wall is made by ramming in the earth, supported during the process by a mold formed of two planks of inch board. These planks for a cottage or similar building should be 12 feet long and 20 inches wide, formed of two breadths, and strengthened with cross-pieces strongly nailed outside; but for a hen-house, summer-house, or similar edifice of less importance, they might be shorter. Cross-bolts fix these planks together (two near each end), with as many inches between the two boards as the wall is to be thick, say 14 or 16 inches, and the bolts have large heads at one end to fix them, and eyelet holes and cross-pegs at the other. Place the planks above the brick foundation, bolt them together, and fit bits of board into the ends, to prevent the building material running out there, the little boards fitting in between the top and bottom bolts, and making (with them) the mold into a sort of box. Then work the earth up well, a little at a time, mixing in cut straw or some similar material to make it bind; and when it is used it should have just moisture enough to adhere together, under the pressure of the thumb and finger. Ram in no more at a time than will make an inch and a half when well rammed; and the rammer, to do its work well, should be no more than an inch and a half wide. When the earth is well rammed down, as high as the mold will allow, draw out the cross-bolts, remove the planks, and fix the mold further on, the bolt at one end being fitted into the hole left by that at the other, only one end board being of course required. When

each layer of the wall is completed the mold must be placed higher, fitting the bottom bolts into the holes left by the top ones, and after each course pour over the surface (to make the next course adhere, and also to give a nice appearance) a small quantity of thick grout composed of one-fifth lime and four-fifths earth.

Before the wall dries, the holes left by the bolts must be carefully filled up with mortar made of one-fourth lime and three-fourths earth. If the same mixture be used for the wall, it will dry almost like stone.

A stout frame of wood must be fixed to shape the door, hatch, and windows, and the building may have a smooth facing given to it of the mortar above named, or one made with more lime, or even a little cement. As a finish it may be washed with a mixture of lime and sharp sand, mixed in small quantities, and used while hot, which may easily be done by adding a knob of lime and the sand a little at a time, as it is used.

The roofing for houses of regular walls, like those of brick, stone, or earth, should be slates or tiles.

A slate or tile roof will be cold in winter and hot in summer unless it has a lining of some kind, for which any of the following substances will do, unless a regular ceiling of plaster be preferred: felt nailed to the under side of the rafters, and tarred; a kind of inner thatch of straw, kept in its place by laths nailed to the rafters; stout brown paper oiled or painted and nailed to the rafters.

Every hen-house should have a good wide door, as it may sometimes be useful to carry a hen-coop through it, especially in wet, ungenial seasons; and the door should be so placed, and so fixed on its hinges, that it will open back thoroughly. A window, too, is necessary, as light within is quite wanted; and it may not be advisable to fix the door open at all times in our climate. Perforated zinc, or close lattice, is good, and will give no more air than enough, except in very intense weather, when it may be covered with a bit of thin board or a sheet of brown paper.

Give the hen-houses a good lime-washing at first, to prevent vermin making a settlement in the wood or small cracks to be found about, and repeat it once a year at *furthest*.

When the house is complete—with door and window for convenient access and ventilation, a hatch for the use of the fowls, a good firm floor, which can neither be too cold, too easily saturated with impurity, nor too facile a harbor for vermin, and which can be kept clean without difficulty, all sweet from the hand of the whitewasher—it must be fitted with perches and nests. All heavy fowls should have the perch made of a fir pole, not less than 4 inches across. One pole sawed in halves will make two perches; they should be about 2 feet, or a little more, from the ground, and they should drop into sockets, so that they can be taken down to clean or lime-wash. Light active fowls often crave to soar higher for roosting, but heavy birds should on no account be allowed to do so.

Almost anything, provided it be steady and clean, does for a nest. Some wild fowls like it to be secret and out of the way, but those that are tame and much noticed care little about that; only take care that it stands firm (to provide against losses), and that it is filled with clean straw or hay. Straw is best in warm weather, as hay is said to be heating, and consequently to encourage vermin.

HOUSES AND RUNS

With regard to the size of the hen-house, the important point is that it should be sufficiently large for the air to keep pure and sweet when the fowls are shut up at night. A house of medium size, with a few fowls, is preferable to a large one with a great many.

One favorite form for poultry houses, with many extensive amateurs, has always been ranges of houses, side by side, each having a run belonging to it. Another plan has been a circular, octagonal, or square building, of large size, parted into several poultry houses, and with a run to each division arranged round the building.

Every poultry run should have a shed. A felt roof on fixed supports, with a pitch from 4 feet at the back to 3 feet in front, will do. A little common boarding under the felt will make it very good, or a roof of feather-edged board will do exceedingly well. It should have a warm aspect; under it should be spread fine dust in which the fowls may roll and cleanse their feathers, gravel to give small stones, without which fowls can not remain healthy, and lime rubbish, or lime in some shape for egg-shell, without a due supply of which they will not lay well.

Where the range is necessarily small, the important point is to have a small number of fowls in proportion to its size, and to clear off all supernumeraries before winter. Grass is excellent for fowls, but it is impossible to keep a small run in grass, as the constant tramp and scratching of even half a dozen grown birds will make it bare.

A well-laid run, kept clean, *will do* for fowls, but a grass run is far preferable, if it can be managed.

FEEDING

Perhaps there is no method of poultry feeding so injurious as throwing down a lot of food, from which they can fill their crops, scarcely moving from the spot where they stand. Fowls thus fed will grow fat internally, but they will not put on good firm meat, and strong useful muscle, nor will they acquire stamina and good constitutions.

Good feeding rather requires good space, but if the run be small, it must be made the most of by throwing the food as far as can be, and making the fowls run the whole distance, as many times as possible.

In a small run, where the green food must be given to the fowls, instead of their going afar to seek it for themselves, it is a good plan to tie up cabbage stumps and lettuces for them to pull at, rather than to throw them on the ground.

Three meals a day are quite enough for any grown fowls; those that have range enough to enable them to pick up much for themselves will do well with two.

A good supply of clean, pure water is as necessary as a regular supply of food. Perhaps there is nothing better in which to give the water than firm-standing crockery pans. They should be placed a little sunk in the ground, very firm and steady, in some out-of-the-way corner, where the fowls are least likely to step into them or overturn them, washed thoroughly inside and out once a day, filled once a day, and filled up whenever they require it. Each pan should hold as much water as the fowls for whose use it is intended could consume in twenty-four hours, but it should be replenished oftener in case of accidents.

The different kinds of food used in feeding poultry are: grain of many varieties, the meal made from them by grinding, root and green vegetables, and meat, either given by hand, or found by themselves in the shape of worms, grubs, and such like. It is the best economy to buy food of the best quality, for poor or damaged things are dear at any price. The food, of whatever sort, should be fine of its kind, and in good condition. Worm-eaten corn, and meal which is full of mites, is deficient in nourishing properties and unwholesome.

Next in importance to good food is good variety in diet. Animals need change of food, and always thrive best and produce best upon it. Barley, oats, wheat, buckwheat, Indian corn, the meal made from all these; potatoes, lettuces, and all kinds of garden stuff offer a good variety, and may be yet further varied with rice, mangold, linseed, vetches, turnips, etc. A change, altered week about, has often been found to succeed.

Barley is used as whole corn more than almost any other kind of food, and it is good, but the stock will not thrive on it or any other grain without variation.

Wheat is very nourishing, but rather too heating for poultry which has not full liberty.

Buckwheat makes an excellent change, and promotes laying; on the Continent it is more used than any other grain. Fowls like it very much when they get used to it, but when it is strange they will sometimes overlook it on account of its dark color.

Indian corn is good as an *occasional* change; its fault is that it promotes internal fat rather than general plumpness, on which account it should be used with caution, and not for too long at a time.

The diet of fowls should never, however, be entirely corn. Since their gizzards are made for getting nutriment from corn, we do not think the use of it should be excluded, but they are omnivorous, and it is best to feed them at all times partly on soft food, *i.e.* meal, and such like, and partly on corn. If two meals a day are given, we would give one of meal and other soft food, and one of corn; if three, one of corn and two of soft food generally, and sometimes, for a change, two of corn and one of soft food.

Meal of different kinds is the staple material for soft food. Perhaps the best of all is oats ground up, as already mentioned.

Barley meal is a good plain meal of moderate price, for common use, and one which the fowls always seem to relish well.

Oatmeal is dearer. Good round Scotch oatmeal is excellent from its nourishing properties.

Malt dust is said to be very nourishing and good.

In buying meal, great care must be taken to get it good, as if it be old, stale, and mity, or made from bad corn, no stock can thrive upon it. It should be newly ground, from good corn, and kept, until used, in a cool, dry place.

Potatoes are very good poultry food, in change with food of other kinds. The more mealy they are the better they are for food, so that if they are boiled they should be cooked in an iron pot, and put to dry after the water is strained from them. When they are given they may be broken to pieces, and scattered far and wide, like other food. For developing the mealiness, they may be better steamed than boiled, and yet better, by far, baked.

In feeding young stock, take care that the food is thoroughly good and appetizing, fresh and well made. Satisfy hunger at every meal, leave time between the meals for hunger to return, and never pamper appetite. If the chickens refuse to eat, they often know better what is good for them than we do, when we try to press or force them.

As the chickens approach maturity they will eat enormously. Let them do so. Let them have as much exercise as you can provide, and plenty of food will not hurt them. If they become too expensive, eat or sell them; clear them off any way you can, and leave space at liberty for future use.

All fowls, old and young, want green food. Giving them free access to grass is the best way of supplying it, and if we have not the opportunity, we may give them turfs of grass in their runs. If the turfs are too large and heavy for the fowls to knock to pieces, they may be removed to a safe place and watered, and used again and again as often as the grass grows. Fresh cuttings of a lawn may be thrown into the runs, and will be relished.

Lettuces may be given to fowls and ducks; turnip greens are good for them, and cabbage leaves, and any refuse from the garden may be given, if grass, lettuce, or turnip greens are not to be had. In the absence of green, boiled roots are better than no vegetable food.

Animal food also is necessary. That which they get for themselves in the shape of worms, grubs, etc., is the best, and in its absence the want must be supplied with a little cooked meat, cut small.

Forcing breeding—wheat, beans, peas, and meat—may induce fowls to lay abundantly, but will not produce lastingly strong, healthy fowls; and those thus fed will seldom either live out their natural term of life, or produce chickens of natural strength and stamina.

EGGS AND HATCHING

Warm housing and abundant feeding make the hens lay early, provided they do not become too fat. Meat will bring them on to lay, and buckwheat, oats fried in fat, and brewers' grains are all good stimulants.

As the chicken season approaches, the best hens should be watched, that their eggs may be known, written on, and put aside in order, as they are laid. If any have imperfect shells—a smooth, round mark on one side, an appearance of a grown-up crack, a look of weakness anywhere, or any irregularity of shape—they had better be rejected for setting, as they would be little likely to hatch, and very likely to break in the nest before the term of incubation was up, thus doing harm by soiling the other eggs, and possibly inducing the sitter to become an egg-eater by the temptation of a cracked egg, too strong to be resisted. The eggs, until they are wanted for setting, may be arranged in a box, according to freshness, and kept in a place where they will be cool, if the weather be hot, and safe from frost if the weather be severe.

Eggs should on no account be stale when they are set, as, if they are, they will very likely not hatch, and if they do hatch, the produce will be weakly. If the eggs are set at once, without becoming cold after they are laid, they will often hatch a day sooner.

There is no doubt as to its being best for a hen to let her sit once a year, or even twice, especially if she be a good layer, as the rest and good feeding she gets while she is on the nest and rearing her chickens prove very restorative. If, however, it is necessary to break her of the wish to sit, it may best be done by changing her to a grass run, where she can find no nest to take possession of, or coop her on the grass, out of sight of her nest, and avoid overfeeding.

If the broody hens are to be set, an appropriate place must be prepared for them. It never answers to let hens sit in the henhouse where other fowls are kept, as they will be continually interfering with them, and interrupting their work. They must,

therefore, be removed to some quiet place which they can have to themselves; and even then they will want watching until each one gets thoroughly established on her own nest, lest they squabble together. The place for the sitters should be warm in spring, and not excessively hot in summer, as heat occasions too much evaporation for the well-being of the eggs, and often besides makes the hen feverish and ill, and consequently restless, and apt to come off too often and to break or crack her eggs by fidgeting. A damp, warm atmosphere is most favorable to incubation.

A box or basket well filled with clean straw, rammed down tight, a foot or more in thickness, under the hen at first, is good. Never use a nest, unless it be a hole in the earth, which has not a good, massive thickness of straw under the hen; for if her attention to her own arrangements displaces the straw, and leaves the eggs on the bare bottom of the nest, there is positively no chance of success. A good sod of turf, covered with grass or close heather, the size of the nest, fitted to the bottom of it, with a nest of straw over, makes a very good nest.

Let every sitter have a clean, new-made nest, as one taken from the hen-house, or which has been in use before, may be infested with insects; and never let the same nest be used twice for sitting without having it thoroughly cleaned, washed, and filled with fresh straw. The nest should be quite full to the top, so that the hen may never run the risk of breaking the eggs by having to jump down upon them.

When the sitting place and nests are duly prepared, the sitters must be removed to them. Place them on the new nests, with not less than four nest eggs, or hard-boiled eggs, under each, and cover them up, or hang things round them, so as to keep them in the dark, until they are settled to the new nests. Let them keep to the nest eggs until they have been off to feed once only in the day, and returned to the right nests steadily of their own accord. Then the eggs may be given to each, from nine to thirteen, according to the size, with some certainty that the sitters will do well. It is a good plan to set two hens at once, and three are still better, as, if the broods are not large, they may be put together, or if any accident happen to one hen the eggs may be saved. If two broods be given to one hen to bring up, to save trouble, the second hen may be broken off from sitting, taking care to place her where she can not hear the chickens; it does not often answer to set a hen on a second time with fresh eggs.

INCUBATION

The setting of hens, however, is but little resorted to nowadays. Such excellent incubators are sold, and at prices so low, that there is a great saving of time, labor, and money in employing the method of artificial hatching. Incubators can be bought at prices ranging from $5 up to $40.

All of the old-style machines that had to supply moisture are now going rapidly out of the market. So also are all the old styles of hot-water machines, hot-air incubation being regarded by the latest experts as the most successful. The machine should be one that preserves the natural moisture of the egg by taking off direct air currents, thus avoiding the necessity of putting in water to make up the moisture deducted.

The art of artificially hatching hens' eggs has been known from the remotest ages. In Egypt, tradition attributes the invention to the priests of the Temple of Isis.

It is impossible to determine at what period or to what nation the construction of the first eccaleobion should be credited. The first authentic account of the early methods is in "The Voiage and Travaile of Sir John Maundeville, Kt.," in his description of the River Nile, Egypt, its geography, productions, etc., written at some time previous to 1336, in which he tells of the baking ovens at Cairo, which are now only found in Mausoura, in the village of Berma, situated in the Delta of the Nile. The Chinese have practiced the art for centuries, but do not seem to be able to duplicate the results when imported to other countries, on account of the climatic conditions being different.

The Egyptians must have had a thorough knowledge of the details of their method, for we find those having ovens, and making artificial hatching a business, giving sixty newly hatched chicks in exchange for one hundred eggs.

To John Champion, Berwick-upon-Tweed, England, 1770, however, probably belongs the credit of first hatching eggs by the aid of fire. He used a room through which passed two heated flues, the eggs being placed on a large, round table in the centre. He claimed that the incubation was per-

formed as well as if they had been sat upon by a hen.

From this time on to 1846 little was accomplished, though Bucknell and others attempted the artificial process. James Canteto was more successful, and gave the subject considerable study. The theories that he put forward at that time have been used as a basis for the construction of the various incubators to the present time.

Messrs. Jacob and Henry Graves, of Reading and Boston, Mass., were among the pioneers of this line of invention in this country (1870), followed closely by H. J. Haight, of New York City, and Messrs. Woodward and Millet, of Charlestown, Mass., in 1871.

It is most remarkable that, though the various modifications of the incubator came thick and fast from 1875, none of the inventors for some time considered it of enough importance to investigate the old and formulate new principles based on reliable data, interpreted by the aid of the known laws of physics, a popular knowledge of which has increased rapidly during the last half-century. There have been sufficient time and money expended in perfecting various machines for incubating purposes, but the workers in this line had to grope their way in the dark, and in consequence many of the contrivances which have encumbered the patent list have been based on no principle, justified by no proof, while some, even, are still in direct opposition to the laws of nature. Upon a knowledge of these laws depends the whole question of right and wrong, of success or failure.

However, the modern incubator was introduced less than thirty years ago, but in that period its influence on the poultry industry has been marked. For instance, in 1898, the State of Missouri alone produced 70,000,000 pounds of poultry, and nearly 36,000,000 dozens of eggs, with aggregate cash returns of $8,298,232, in value exceeding the combined shipment of wheat, corn, oats, and hay, and the combined value of the shipment of lumber, logs, cross-ties, piling, cooperage, and cordwood, for that State. This remarkable showing is largely due to the modern incubator, for it has indirectly given the farmer and professional poultryman first-class poultry houses in which to keep first-class stock.

It has taught them cleanliness, both with buildings and stock. It has developed their gray matter in endeavoring to solve the difficult problems in feeding and in operation of incubators. It has made early spring broilers and early summer roasters possible. Most important of all, it has taught them to look upon the hen, as a producer, as one of the world's greatest commercial factors.

To run an incubator requires about ten gallons of oil, and about ten minutes of labor per day for twenty-one days, this being the period of incubation. The cost of raising a chicken to the age for a two-pound broiler is about twelve cents per pound, while the price for which such broilers may be sold runs from twenty to forty-five cents per pound.

Adult hens cost, when properly kept, about a dollar a year each. The average yield of eggs is 120 to 175 per annum. Leghorns are the most prolific layers. For broiling purposes, Barred Plymouth Rocks and White Wyandottes are preferred because of their early development, the latter being especially excellent on account of their rich, golden flesh and absence of black pin feathers.

When selecting eggs for incubation, the poultryman should pay especial heed to the purpose for which he requires the chickens.

REARING CHICKENS

When a hen is set, the sooner she can be removed to a clean nest, free from vermin, the better. That which has been set in three weeks will have chickens' fleas, encouraged and increased by the unusual warmth, and if the chickens remain in it, they will swarm to their soft down in a manner to preclude the comfort and health of the brood. So, as soon as the eggs are all hatched, or found not likely to hatch, put the mother and her brood into a comfortable, warm, clean nest.

If the weather be cold, warm the straw before the fire for a few minutes, or warm it in the sunshine if there be any, that the latest hatched—some of them possibly scarcely dry—may not be chilled by the change; and when the hen has settled down quietly, with her little ones under her, place food and water before her, that she may eat and feed her young family. The food thus early may be chopped eggs (shell and all), bread-crumbs, sop, oatmeal and barley meal mixed, dry and crumbly, and crushed corn, giving now as later only one thing at a time. The drinking-pan should

be shallow that the chickens may not get wet by going into it, or turning it over; and constantly replenished.

If the weather is mild and dry, the sooner mother and family can be placed on the gravel, out of doors, the better; but at first it must not be for long at a time. They may be put down, with advantage to themselves, on the floor of a greenhouse; and if the hen can be allowed a roll in some dust in one corner, it will be good for her and for her chickens, too.

Under a shed, where the ground is clean dust mixed with small stones, is a good place for cooping the hen for the first ten days or so; and she may after that be placed on the grass in dry weather, but not before the dew is off it. During a portion of each day she should be cooped where she and her little ones may enjoy a roll in dry, dusty earth.

In choosing a place for cooping the hen, care should be taken that she can have the shelter necessary for comfort. When she is loose she can lead her chickens into the shade, or into the sunshine, or to warm nooks sheltered from cold winds; and it is cruel to confine her to one spot. In the kind of coop used, and in placing the coop, take care that there is ample and complete shelter from wet. When the wind is cold, place the coop where the hen and her chickens may be sheltered from its chilling influence. During the heat of the day, shade from the broiling heat of the sun is as necessary as shelter from wet and cold.

If the brood is housed at night, the hen may brood them on the ground, if it be bare earth, not cold pavement. She may either have a little straw thrown down, or take the chickens into a large, shallow, firm-standing basket. The main thing is, whatever the bed be, let it be clean and sweet; whether it be the earth or straw, let it be well cleaned every day, and renewed when it becomes soiled.

If two or more broods are put to roost in one hen-house, the old hens should be confined within coops, or they may interfere with each other or injure one another's chickens.

The spite of hens toward chickens not belonging to them must always be guarded against. The best way is, if it can be managed, to place the coops so that they can not see each other.

From the time the hen is cooped out, especially after the wing feathers begin to show, the chickens must be plentifully fed on good food, well varied. Rice pudding, made of rice, sharps, or Indian meal, and milk, and baked, makes excellent nourishing food, to which eggs and chopped meat, one or both, may be added. Rice, boiled, and rolled in sharps or Indian meal, instead of the pudding, is good. Other kinds of food are oatmeal and barley meal, mixed into a dry, friable mass, canary seed, crushed oats, and crushed barley. These may be varied with cooked potatoes (baked are best), bread sopped in milk or in water (brown bread is preferable to white), and buckwheat. To get size, meat may be given every other day. They should have green food of some kind every day. Varying the meals, and sometimes giving an entire change, feed the chickens constantly, as often as they get hungry, with as much food as they and the mother like, leaving none to get stale, waste upon the ground, and encourage hosts of sparrows. When they no longer eat eagerly, with a good appetite, throw no more down. At first, they will want a bit about every hour, and by degrees they will get hungry less often, until six meals a day will be enough.

Chickens which are hatched before the natural time—that is to say, before the nights become mild and the days sunny, and before the earth teems with insects which they can catch for themselves, and the absence of which no meat will compensate—must have a little artificial warmth.

Chickens hatched thus early must be fed after dark, as fast from dark to daylight is too long. About ten o'clock at night put down a candle or a lantern, and place food and water before the hen, and the little ones soon get into the habit of expecting a meal at that time, and of making a good one.

It is a mistake to feed chickens on plenty of excellent food for the first three weeks, and then to some extent leave them to take their chance. As the fledging advances, they require better and more nourishing food than they do while in the down. The call which the growth of the feathers makes on the resources of the chickens is attested by the wonderfully rapid growth which immediately commences as soon as they are fledged, and this increased rate of growth renders good feeding still no less necessary, and so on until growth is complete.

About the best kind of coop is a wooden box, with a span roof (either 2 or 3 feet square, according to the space at command,

and the size of the stock kept), to give shelter and shade, with a run of wirework rather larger to place in front of it, to increase the range for the hen. She may make use of both and the chickens have full liberty, running in and out through the wirework.

By the time the chickens are turned off by their mothers, it is generally necessary to clear them from the ground they have hitherto occupied, to make room for more young broods. It is far better if each brood can then have a house and run to itself. If so much room can not be spared, care must, at any rate, be taken only to put together chickens of about the same age.

A few chickens well bred, well accommodated, well cared for, and well fed, will turn out a pleasure and a credit; a good many chickens crowded together, however carefully looked after and fed, will give a great deal of trouble, constant work, constant care, and constant disappointment, and make no commensurate return, either in satisfaction or profit.

The difference between cockerels and pullets may sometimes be detected while they are very young. In some, the cock's comb soon shows. In most kinds, the arrangement of the first wing feathers is rounder and wider in pullets than in cockerels, whose first wing feathers come more to a point; the pullets' heads are often narrower and finer than the roosters', and they fledge earlier on the back, down the sides of the breast, and at the back of the head. In fine, robust chickens it is sometimes difficult to pick out the cockerels and pullets until the back is partly feathered, when the pointed saddle hackle feathers soon begin to sprout—the surest test of all.

As the chickens approach maturity, good feeding must still be continued, supplying the place of the rice puddings, canary seed, and other young chicken dainties with abundant supplies of oatmeal, barley meal, and good corn, and using discretion as to the supply of meat. The bits from the table may always be collected and divided among the chickens.

As they approach maturity, too, they must be allotted to their destinations.

The young birds which are picked out for the table may also be put to their destination. Plenty of exercise develops strength and firmness of muscle, and is good for chickens which have the duties of a long life before them; *i.e.*, a life which is long for chickens, four or five years or so. For eating, we want tender, not strong, firm muscle; therefore the chickens which are to be eaten need not have an extensive range. They may be made happy in a small run, and well fed with several meals a day of oatmeal and barley meal mixed, just so dry that the balls will fall to pieces when they are thrown down, and a little corn, with good supplies of clean, fresh water. Those who like good chickens in natural condition may follow this plan, giving them, for a little time before they are wanted, rice boiled in water, in milk, or made into puddings, as for young chickens; but those who like to fatten their fowls for the table can put them up in fattening coops.

When they are put up, feed with moderation at first, as repletion then, or at any time, would retard the fattening process. As soon as they are reconciled to captivity, feed them on oatmeal three times a day. Milk for mixing the oatmeal is best; every meal must be given in a well scalded, clean trough; keep the coops supplied with clean water, and between the meals place down gravel, for them to peck at, and a turf of grass. Keep the coops scrupulously clean; give the first meal at sunrise, or thereabout, and the last at roosting time, and the chickens will be ready to kill in about ten days or a fortnight. As soon as they are fat enough they must be killed, or they will become unhealthy. When one lot is fatted, take down the fattening coops, scrub and limewash them, and put them out in the air for a time before using them again.

Those who wish to make fowls very fat by the unpleasant process of cramming, may either choose the finest and healthiest from the fattening coop, or any good fleshy young fowls. The food used is oatmeal, mixed stiff with milk, made up into boluses of a size that may be put down the chicken's throat without danger of choking. To fatten more rapidly, mutton suet may be boiled in the milk used to mix the oatmeal. The person employed in the cramming process opens the chicken's beak, and puts six or eight boluses down its throat morning and evening. If it seem to wish for food at noon, a little can be given it in the trough, which must be supplied also with water and gravel. Those which have been put up will be finished off in a week; those which have to be fattened by the cramming will take fourteen or sixteen days. While

they are fattening by either process they must be kept free from draught, as they will fatten all the better for being comfortably warm.

Some persons kill fowls by bleeding them in the mouth; others wring their necks. The quickest and most merciful way is with a dexterous jerk to *break* the neck.

FANCY VARIETIES

DORKINGS, SPANISH, AND COCHINS

The chief large fowls occupying the attention of fanciers are Dorkings, Spanish, Cochins, Brahmas, Malays, and Crèvecœurs, and the other French breeds.

It is not necessary to notice here the various breeds commonly found in barnyards, since these are generally familiar and in no sense "fancy varieties."

Dorkings.—The chickens are delicate until they get into their feathers, and Dorkings of all ages are more subject to roup than most kinds. Unless they have a good or well-drained soil, or an extensive grass range, they do not lay well, and do not thrive well. On the other hand, they are excellent and economical for persons to keep who supply the markets, provided they possess facilities for keeping and rearing them with success, because they come forward early; they make their growth early in life, may be fattened off, and cleared off early, and thus leave the ground at liberty soon, and enable the owner to realize his returns in a short time. If Dorkings are kept, they must have great care in feeding, and perfect cleanliness. The stamina of the chickens may be improved by crossing with Brahmas, Cochins, or Game.

The hens are good sitters, and attentive, good mothers, and where the locality suits them they are very good layers of nice, well-flavored, and rather large eggs. There are few kinds which vary more, as layers, than they.

The white Dorking is the original type of the race. It should have a square, plump, compact form, plumage of spotless white, delicate white skin, white legs, which should be delicate, not coarse, five toes well developed, clear white or pale yellow beak, and a well-formed, full-colored rose-comb. Size is an important point, and one in which white Dorkings have sometimes failed, but which the careful introduction of fresh blood from time to time improves.

The fifth toe on each foot is a matter of primary importance in all Dorkings, white and colored. Careful breeding has firmly fixed this property in the Dorking; and no fowl without it would have a chance of success at an exhibition, or of being purchased as a Dorking fowl anywhere. The fifth toe should be distinct and well developed on each foot; a sixth is no merit. The legs must have no feathering.

The colored Dorkings, like the white, must be plumply made, compact, and wide, with plenty of meat on the breast, short legs, and little offal. The comb may be single or rose, but all the combs in a pen must match well. The legs must be short, white, and delicate; *i.e.*, not coarse in the scales.

The plumage of colored Dorkings varies much, as may be expected in fowls which have been bred chiefly with reference to useful properties.

Spanish.—Brilliant black plumage, bright scarlet combs and wattles, and distinct and clear white faces make these fowls very attractive, and they are among the oldest as well as greatest favorites of poultry lovers; for early in last century, specimens which were at the time thought very choice, were imported into England from Holland. It seems probable that the kind may have been introduced into Holland from Spain, and taken up and improved by the keen Dutch fanciers, but now amateurs can find no vestige of the kind in the country which gives them their name.

Spanish roosters, especially, have a tall, majestic carriage, and this kind have the merit of doing well, and looking handsome and ornamental, if kept in a confined place, provided it be not overcrowded. The hens lay eggs which are very fine in size, but they are apt to be more woolly and less delicate in the white than those of many other fowls.

Cold, especially if it be damp cold, spoils the appearance of the old birds, by injuring the combs and turning them black. The combs of the hens shrink very much, and lose their beauty, while they are moulting, or when they are laying.

Spanish hens do not sit, so other sitters must be provided to hatch and rear the chickens; and for this purpose it is best to choose Dorkings, if possible, or, at any rate, some kind which does not throw off the chickens early. Spanish chickens had better not be hatched very early in the season, as they fledge late, and are delicate

until they get into feathers; from March to May is the best time.

The Minorca is a variety of the Spanish, which, although wanting in valuable fancy points, is a good-looking, useful fowl, large in size, better for the table than Spanish, and a good layer of fine, large eggs.

The Andalusian fowl is rather an attractive-looking bird; in form and carriage much like the Spanish, and evidently of the same family, with plumage either of a uniform slate color, or slate shaded or laced with black, and showy, well-developed scarlet combs and wattles. It has been stated that they were brought from Andalusia, but some affirm that they have been bred from the Spanish—an accidental sport.

Cochins have the merit of being excellent layers. Good Cochin hens will lay every day, or two days out of three, until they want to sit; and they have the merit of being good layers in the winter, when fresh eggs are rarities.

The thing which most interferes with the production of eggs is the Cochin's constant habit of wanting to sit; but if she is allowed to sit, she very soon lays again.

Cochins are tame, docile, and manageable; little children may tend them without a chance of getting hurt, and they are friendly among themselves. When the hens sit, we may do what we like with them, and they are kind mothers as long as their nice little, hardy chickens require their care. We can keep Cochins where we can keep no other fowls, and make them profitable with no other drawback to counteract all their merits than a too frequent wish to sit, and the character they have of not being good for the table, which any careful breeder might remedy to a great extent.

Cochins, like all fowls that lay so many eggs, are rather greedy eaters, and they are very ready to fatten internally (hence often the shelless eggs, and two eggs a day); so that in feeding them care must be taken to feed moderately, and to avoid food of too fattening a nature. The fowls and the chickens will do well if fed and treated as recommended in the chapters on feeding and chicken-rearing. The dangerous time is from the time the wing-feathers are grown until the head is covered; and then they want plenty of good nourishing food. They are nicest for the table at from five to seven or eight months old; as young chickens, they are not nearly so good, but are better fowls when nearer maturity.

COCHINS, BRAHMAS, MALAYS, AND THE FRENCH FOWLS

White Cochins must, of course, be perfectly white in plumage, and shown very clean.

Black Cochins have almost disappeared, on account of their incorrigible habit of moulting to a mixture of colored feathers among the black. The hens remain black, but the roosters almost invariably display a mixture of red or yellow after the first moult, if not before.

Brahmas.—No one knows the original stock; no one knows whence they came originally; this is the accusation that is brought against the Brahmas, the best fowls we have ever had, as regards the number of useful properties they possess.

The Brahmas are tame, docile, of a contented disposition, and almost as easy to keep in as the Cochins; but they like a good range when they can get it, and make the most of it far more industriously. The pullets do not lay so early as Cochin pullets, but taking the year round, the Brahmas produce more eggs than Cochins do, from not wanting to sit so often. They are good sitters and mothers, lay early after hatching, and often tend their chickens for weeks after they begin to lay.

They are good table fowls, being ready in putting on flesh, compact in make, full in the breast, juicy, and good in flavor. They should be large and heavy, of a free, majestic bearing, removed alike from the waddle of the Cochin and the upright carriage of the Malay, compactly made, not long in the leg or neck, wide and full in the breast, wide and deep in make; legs are yellow and well feathered. The head is delicate in character, with a fulness over the eye which gives breadth to the top of the head, and a full, clear eye. The tail is short and full.

In color, Brahmas range from an almost white plumage, with more or less black penciling on the hackle, and black in the feathers of the tail and wings, to dark-gray plumage. Perfection in a light Brahma is a white surface, with well-marked hackle, wings, and tail, and such uniform pearly-gray under-color that the feathers can not ruffle without showing it.

The Malay.—Malays are great favorites with a few, but from their peculiar gaunt form they are by no means generally liked or kept. They are large, heavy birds, with such hard, close feathers that they are more

bulky and weighty than they look. They are tall, with an upright gait; the tail is drooping and small, with beautiful, but not long, sickle feathers. The thighs are remarkably long, strong, and firm, and the tarsi round, stout, and yellow. Their head is snake-like, with great fulness over the eye, giving it a flattened form on the top. The Malay has a bold eye, a red, skinny face, and a strong, curved hawk-beak. The comb is short, small, very thick, and close to the head, resembling half a strawberry; the wattles are very small, and the wings rather set up.

The favorite colors are different shades of rich chestnut brown, or cinnamon. There are also black-breasted reds, black, and white.

As fowls to keep, they have the great merit of doing well in any back-yard, and looking handsomer there than at a show. The hens are often pretty good winter layers. The eggs are of medium size with tinted shells; they are good in flavor and hatch well. The Malay hen is a good sitter and a good mother, that will hold her own, and defend her brood with her good strong beak, if necessary. The chickens are hardy little things, if well bred, but they fledge late, and look gaunt and ugly when half grown.

Crèvecœurs and some other French breeds fill up our list of large fowls. It is curious that the change from a more favorable to a worse climate should seem to affect the well-being of fowls detrimentally, in going only across the Channel, as the Crèvecœurs, La Flèche, and Houdans do, and not in going half the circumference of the globe, as in the case of Cochins, Malays, and other Asiatics: but so it is. As far as we have had an opportunity of judging fowls that have been imported from the further side of Asia do well from the time of their arrival; but many who have had the French fowls have found the Crèvecœurs more subject to roup than even the Dorkings, and the La Flèche change from the good productive fowls, which we suppose they are in their own country, to but indifferent layers.

The Crèvecœur, when it thrives, is an excellent fowl for the table, being square, plump-made, and large, ready to fatten easily (if in thorough health and good condition), compactly formed, and short in the leg. The hens are said to be good layers; their eggs are very large, and they are not sitters. The chickens come to maturity early, and one authority says the pullets often exceed the cockerels in size. They are evidently allied to the Polish, which are nice tame fowls to keep, but delicate in a damp, chilly, variable climate. For exhibition, the color of cocks and hens should be unvarying black throughout, with metallic lustre on the feathers, but to breed them so requires great care as they are very apt to have a mixture of colored or white feathers. As in black Cochins and some other black fowls, it is easier to breed the pullets quite black than the cockerels. The crest is full, large, and globular, and in front of it is a comb in the form of two well-defined pikes, and these horns sometimes grow large and spread into branches. The fowls are bearded, and the legs blue and short.

The *La Flèche* is also a black fowl with metallic lustre, large and plump-made It is good for the table, but the legs are long and dark—a great objection. The eggs are very large, but the hen does not produce well, and she is a non-sitter. The head is very peculiar, being graced with a comb in the form of upstanding sipkes, in front of a dark-crest, a peculiar rising over the nostrils, large white ear-lobes, red face, and long red wattles. The plumage is very close and firm; the tail large. The legs dark-blue or slate.

The *Houdan* is the last of the French fowls which have gained a certain popularity among fanciers. It is compactly made, the body round and well-formed, the legs short, thick, and blue, or slate-colored, and five-toed. It is good for the table.

HAMBURGHS

The Hamburgh family is a large one, including two totally distinct races of fowls, the Spangled and the Pencilled—Hamburghs they are both called—but they are about as distinct as Cochins and Dorkings. Both kinds are divided into two—the Golden and the Silver.

The Golden-Spangled Hamburghs, or Golden Pheasant Fowls, were very generally known by the last name until recent fancy dubbed them Hamburghs.

They are good useful fowls to keep, and excellent layers, but non-sitters. The eggs are not large, but larger than those of the Pencilled Hamburghs. The fowls are pretty hardy, and easy to keep in condition, but

the chickens are rather tender. They are nice plump fowls for the table, although small. In breeding them the parents should be exact in the marking and rich in color, the rooster darker than the hen: it is best, for maintaining precision in marking and other points, to give the cock very few mates.

It is well to avoid stimulating food, when giving it may induce precocious laying. A young fowl, be it pullet or cockerel, should be well developed in firmness of bone, muscle, size, and furnishing, before it assumes the position of a productive adult, that it may turn out one which will do us good service for the natural term of its life.

All the Hamburghs are inherently fond of liberty; they want a good range, a trifle will not prevent their breaking bounds to obtain it for themselves, and their lightness and agility enable them to fly like sparrows.

Silver-Spangled Hamburghs are the same as the Golden in general properties. If there is any difference between them, the Silver are the stronger; they are the best layers, and the eggs are rather the larger.

Golden and Silver Pencilled Hamburghs.—The Pencilled Hamburghs are so distinct from the Spangled in some important characteristics, that it seems wrong to include both under one general name. They are more fragile in form and constitution, and different in shape and in plumage, although all the Hamburghs agree in comb, and several other points before mentioned. The Pencilled fowls are known under the different names of Bolton Bays and Grays (the gold and silver), Chittiprats, Corals, Creoles, Dutch every-day layers, everlasting layers, and many others.

THE POLISH AND THE VARIOUS CLASS

The Polish fowls are pretty, compactly made fowls, rather under than over medium size; for the Polish of the present time are decidedly smaller than these fowls used to be from twenty to thirty-five years back. The eggs, too, are smaller. This degeneracy may be the result of in-and-in-breeding, which may also account for their exceeding delicacy of constitution.

Their beauty renders them great favorites; they are mild-tempered, timid birds, loving a genial, sunny spot, and much disliking to be handled. They are good layers of white eggs, which are large for the size of the hens; and for the table the flesh is white and tender, but the chickens are small for that purpose. The hens are non-sitters. All the Polish sub-varieties are decidedly fancy fowls, requiring and repaying great care on the part of the amateur.

Silver-Spangled Polish.—The crest of the cock should be white streaked with black; that of the hen white laced with black. The hackle of both cock and hen white streaked with black, and the wings accurately barred and laced. In the cock, the more the remainder of the plumage can be spangled the better, and the tail should be white, with a rich, well defined spangle at the end of each feather. In the hen, the remainder of the plumage should be accurately spangled, and the tail white, each feather spangled with black. The legs are blue, and the head free from comb or gills.

Golden-Spangled Polish.—The ground color throughout is a rich golden brown, the hackle of both cock and hen streaked with black, the wings barred and laced, the breast spangled, and the tails black, so well bronzed with the rich ground color of the plumage as to harmonize with it. If there be a beard, a good mixture of the ground color is better than a prevalence of black. The top-knot, too, should be streaked in the cock and laced in the hen. Black feathers and white in the crest are faults, but the white feathers *will* come in both cocks and hens as they grow old.

The original Spangled Polish fowl appears to have been a bird in character like the Polish, the ground color of the plumage of a rich golden brown, with spangles of white and black united in each spot, and white legs. These and two other beautiful varieties are entirely or almost lost.

BANTAMS

The distinguishing characteristics of the Sebright bantams, besides their exactly laced plumage, are diminutive beauty, and jaunty, impudent carriage. Roosters of a year old should not exceed 21 oz. in weight, nor hens 18 oz.; and some advocate much smaller size still. Smallness of size is an important point in all Bantams, so that the smaller they are the better. To gain this point they are generally bred late in the season, sometimes very late, but seldom earlier than July. Many have been so dwarfed as to interfere with their reproductive qualities, and the breeders have had recourse to larger specimens as home stock-birds, reserving the very small ones for exhibition and for show. To breed productive stock-birds, the in-

breeding, which favors small size, must be avoided.

The proud gait of the Sebright is like that of the fantail pigeon; the head and tail are held erect until they almost touch each other; the wing is not closely packed away, but is allowed to droop with jaunty gallantry; the body is plump, and the breast protuberant.

The head should be small and delicate, with a well-formed, firmly set rose-comb, close to the head, exactly in the centre, with a well-defined pike, a little turned up at the end. The legs should be blue.

The rooster must have no hackle on neck or saddle, and no sickle feathers in the tail.

The chickens should be bred from mature birds. They must be kept from damp, but in a dry spot they are tolerably hardy. Their diminutive size and compact beauty render them the prettiest among chickens. There is scarcely a prettier sight than a Sebright mother and her little brood. The little ones fledge quickly, and require constant good feeding during the process.

The Booted Bantam is probably the earliest type of the Bantam race; it is, at any rate, the one which has been the longest known, having been introduced in England as far back as the beginning of the seventeenth century. It is a small, compactly made, jaunty little bird, with abundant furnishing in hackle, flowing tail, and heavily booted legs. The plumage is generally perfectly white, but there are also some of other colors. In the early part of the nineteenth century, Booted Bantams were more thought of than any others; afterward they were almost lost sight of; but within the last very few years they have appeared again, and often win prizes in a Bantam class for other varieties.

White and Black Bantams are beautifully diminutive, bold and saucy in gait, plentifully furnished in hackle and tail, and spotlessly white in plumage, or perfectly black, as the case may be. The white and the black have each a distinct class at the shows, where they are always well represented. The white bantam rooster must have a fully sickled tail of snowy whiteness, brilliantly red rose-comb and wattles, and white beak and legs,—the last perfectly free from feathers. The hen must agree. Many may be seen weighing, the rooster not more than 15 ounces, and the hen 12 ounces, and smaller weights are mentioned. The black Bantams are compact in form and bold in carriage. They are hardier than the whites, very prolific, and often very small. The plumage should be unmixed black with metallic lustre. Other points are a rose-comb, small but rather wide wattles, and rather short blue or black legs. In both the white and the black the ear-lobes should be white, but in the black especially; they must be pure in the white, and free from any tinge of red.

Game Bantams must be exact Game fowls in miniature.

TURKEYS AND WATERFOWL

TURKEYS

When America was discovered, turkeys were found in a domesticated as well as in a wild state, and the French name, Dinde (D'Inde), seems to indicate that they came from the West Indies, the East Indies possessing no such bird.

Turkeys do not attain full growth and maturity until they moult after they are two years old. The stock-birds should therefore be not less than three years old, for poults bred from young birds are sure to be tender. To obtain fine turkey poults, let the hen sit on the first eggs she lays in the season, as soon as she will, that the brood may have all the best of the year in which to make their growth. Some turkey-cocks are very spiteful to their hens, and to the young ones, so that it is necessary to put the nest in a place of safety. The presence of the gobbler is not necessary after the early part of the season, as the entire clutch of eggs is said, on good authority, to be fertilized at once.

The turkey-cock should be vigorous and healthy, broad in the chest, clean in the legs, and with well-developed wings and tail. His eyes should be bright, and the corunculated skin of the neck full, and rapid in its changes of color. He is in his prime from three years old to seven or more. The year he is appointed as master at home, or the year after, a fine cock poult should be selected and reared to take his place when necessary. From the peculiar property in turkeys of the whole batch of eggs being fertilized at once, one turkey-cock would well serve a whole neighborhood; but that he should be a first-class mature bird is all-important.

The hen should, of course, match her lord; she should be plump, lively, and animated, and her plumage should be correct. If she be black white feathers are a fault.

Her eggs will produce the hardiest poults *after* she is three years old.

A number of companions may be allowed one cock in the course of a year, but never let him have more than two mates at the same time.

The hen foretells laying by a peculiar note and strut, and by hunting about for a sly corner to lay in. In the domesticated as in the wild state, the cock is apt to destroy the eggs, and the hen is commensurately anxious to hide them from danger. She should be watched and humored to the nest prepared for her.

If the turkey hen is well settled to the nest before the eggs are given to her, the poults may be looked for on the twenty-sixth day; but four weeks is the time of incubation usually reckoned on for turkeys' eggs, and some persons say thirty-one days. Whether the sitter is interfered with or not, when she hatches must depend on her disposition.

The hen turkey will sometimes lay and hatch a second time in the season, but late broods require great care.

Even in a wild state the turkey poults are delicate, and unable to endure wet: the young of the domesticated race are yet more so, and must be kept from wet and cold. The little poults will peck for themselves as soon as nature prompts the necessity: until then leave them with what appears to be their only requirement—their mother's warmth.

At first the little ones may be fed on hard-boiled eggs, chopped fine and mixed with bread-crumbs and herbs finely minced, or on curd and bread-crumbs. The herbs to use with their food are chives, young onion tops, fennel, lettuce, nettles, and parsley. The water should be given in shallow pans, that they may not get the down wet. As they get older they will feed on food made of barley-meal and oatmeal, and on grain. Meal boiled in milk until quite thick is good food.

The little turkey poults want a tolerably free range, and they must be so constantly well fed from the first as never to lose condition; for if they once get poor they can never be restored.

The most important thing of all is never to let the little turkeys get wet, or even damp. Keep them in in the morning until the dew is off the grass, put them up before the damp of evening, and never let them be out in the rain. Cottagers in the country, who think it worth while to keep in the brood in wet weather, and to drive them in when rain threatens, rear them successfully, as it is generally after a wetting that the little poults go bad.

When the turkeys are finished up with cramming, it may be done by giving about six rolls of barley-meal and sugar before roosting-time every night for a week or ten days. In France, the usual food is meal paste mixed with chopped suet and milk, or with ale and molasses. Whole pepper, garlic, aniseed, and tonic herbs are also given. Whole walnuts given daily, from 4 to 40, are said to fatten well. If turkey chicks look heavy and ruffled, a little crushed malt, or caraway or coriander seed, will do good. Let them be fed very constantly, and never be in want for an hour. If they do not run at large, they must have a little meat, turfs of grass, and gravel. Most hens require cooping to prevent their running the chicks too far. The old turkeys are very fond of Indian corn.

GEESE

Common Goose.—It is almost superfluous to say that the usual mode of keeping geese is to drive them out to pasture in the morning and to house them at night. If there be any right of common to which the flock can be turned out, they will almost get their own living, as grass is their main food. Turning their heads sidewise, they nip it off quite close, and consume a good quantity. Whether it is worth while to keep geese on land that would feed larger stock, is a question for economists: but they are worth keeping where they can partly live on grass which can not be turned to better account.

It is well to have a house for the geese and one for the young stock, but any shed will do, and it need not be too closely shut in. Care should be taken that the roof does not let in rain, and that the shelter which the house affords excludes bitter, windy draughts upon the geese at night. The floors should be dry, and if litter is used it must be renewed as often as cleanliness requires. If the geese can have a pond at command within the day's range, so much the better; but they will do without it.

Geese are essentially vegetable feeders; they will eat any kind of corn, pulse, or greens, such as cabbage, lettuce, mangold,

lucerne, tares, and now and then sliced carrots and turnips.

The old geese require a little corn twice a day: a mere sprinkle in the morning, if they have the opportunity of doing much for themselves, and a good feed at night. In mild seasons the goose will lay early: she should have a good, large nest, in a secure, quiet corner, and she will cover about fifteen eggs: the time of incubation is thirty days. Give her plenty of food and water, to which to help herself, when she leaves the nest. She is a patient, good sitter, and a good mother.

In choosing stock-birds, select those which are long in the body and small in bone. The pouch sagging down loose behind is generally a mark of age. Allow three geese to a gander; let all be of mature age, and they will all do well up to twenty years old, if not longer.

DUCKS

Ducks are very hardy, and easy to feed, as regards quality of food; for they will eat almost anything with appetite and relish.

The humble accommodation of a mere shed offers quite good enough housing. The roof should be water-tight, and the ground of the shed pretty dry, to render it a good place for the sitters; as, if the nest be very damp, the eggs are apt to break, however quiet the sitter may be.

Four ducks to a drake are better than a larger number. The stock-birds should be long in the frame, fleshy (not fat), and small in bone.

A good-sized duck will cover fourteen eggs well: according to the size of the duck, the number allotted her may be from eleven to fifteen. Give her oats and water near her nest, that she may come off and feed when she likes; and a run down to the pond and dip therein will do no harm to her eggs, but rather the contrary, by imparting from the sitter's moist feathers the warm damp which is favorable to incubation.

Hens may be set on ducks' eggs, when it is considered that the extra care which can be bestowed on them may realize greater size for exhibition purposes; but ducklings so reared had better not be kept as stock-birds.

For the first few weeks it is better to let the ducklings have no pan of water in which they can immerse themselves, so as to wet the down underneath them.

The bill of fare for young ducks may include cold boiled oatmeal porridge, cooked vegetables, mixed up with barley-meal or sharps, crushed oats thrown into water, and a little milk when convenient; but in giving milk to young things, scouring must always be guarded against.

Ducks, old and young, should have a little litter for a bed—straw, dry fern, pea-haulm, rushes, or anything which is dry will do. The eggs do not keep as well as hens' eggs, so they should be set as fresh as possible.

Aylesbury Ducks must be very large, perfectly white in plumage, with yellow legs and feet, and flesh-colored bills. Dark spots or streaks on the bills have lost many fine pens their prizes. Such blemishes may arise from the ducks frequenting peaty land; to get fair, unsullied bills is a great trouble to exhibitors. A good pen of three drakes and two ducks will weigh 23 lb. or 24 lb., and 26 1-4 lb. have been reached.

Rouen Ducks, in plumage, resemble the wild duck, but they are of splendid size.

The Buenos Ayres, or East Indian ducks, like Bantams among fowls, are the dwarfs among ducks, and are bred as small as possible, and shown young, to make the most of this important point — diminutive size. They must be very small, and quite black, with brilliant green metallic lustre on the plumage. They have dark legs and bills. They often incline to mate in pairs, so that if only one drake is kept to two or more ducks, many eggs will prove infertile; the eggs are colored, and, of course, small.

The Musk, Muscovy, or Brazilian Duck is very distinct. They vary in color, the usual color being a dull black, with white on the under surface, and some other portions of their bodies. A curious red warty cere near the bill characterizes them; and the great difference of size between the drake and the duck is peculiar.

A large black duck, with brilliant lustre on the plumage, called the *Cayuga Black Duck*, is mentioned. It is a native of America, and is said to have been domesticated from some wild stock.

Call Ducks.—The beautiful little Call or Decoy ducks are ornamental and very small.

These are the kinds most frequently seen. There are occasionally sent to the shows the *Hook-billed*, the *Penguin*, and the *Top-knotted Ducks*.

DISEASES

There is little *economy* in an attempt to doctor sick fowls; as a labor of love and a matter of humanity, the case may be different, and we often like to cure or lessen the sufferings of a favorite.

Warmth, shelter, and safety from the molestation of other fowls is often a main remedial measure. A bask by a kitchen fire, for a few days, a retreat where tyrants can not hunt or peck the sufferer, and simple or nourishing food, according to whether the patient is suffering from weakness or repletion, is frequently by itself a curative treatment.

If little chickens pine and droop the wings, a pill of Barbadoes aloes, the size of a pea, or a pellet of rue and butter, may do good if the ailment be taken in good time. Insects must always be duly looked after, dislodged with a dusting of flour of sulphur, and guarded against by cleanliness, and a good provision of dust-bath. Most poultry diseases may be traced to the effect of chilly, damp, and variable climate, so that a warm, sheltered locality, and good shelter for young chickens, are all important.

Douglass' mixture is excellent for giving strength and stamina to old fowls, or young. Dissolve together with a little water 1-2 lb. of sulphate of iron and 1 oz. of diluted sulphuric acid, add spring water enough to make up two gallons, let it stand for a fortnight, mix a teaspoonful of the mixture with a pint of water, and give it to fowls or chickens to drink instead of water.

Decoction of citrate of iron mixed with water in the proportion to give it a very perceptible taste of iron, is also good as a strengthener.

If inflammation in the egg passage be denoted by the production of soft or misshapen eggs, give one grain of calomel, with 1-12th of a grain of tartar emetic. It should be repeated three times in a week at intervals.

If mature fowls appear feverish and drooping, and seem to require a dose of medicine, give one of Plummer's pill, a bit of Barbadoes aloes the size of a large pea, or five grains of jalap in a bolus of barley-meal, according to the strength of the dose required. If, however, they are judiciously fed and properly cared for, medical treatment will rarely be required.

INDOOR GARDENING

NO ARTICLES of home decoration are cheaper or more effective than living plants, nor is there any means of diversion more within the reach of all classes of people. It must be admitted, also, that nothing is quicker than an indoor plant to resent neglect or other bad treatment.

In the warmer months of the year almost all kinds of plants that can be cultivated in pots may be successfully grown on window ledges; to give sufficient water to avoid the baking of the soil by the fierce rays of the sun is almost the only necessary attention. It is in winter, however, when flowers can not be grown out-of-doors, and when the cheapest at the florist's seem costly, that plants are most desirable for the house and require most care.

All varieties of plants that flourish in greenhouses have been grown successfully in residences, but the amateur with little or no experience would do well to begin with varieties that require least care and that are least susceptible to the house-enemies of all life, human as well as vegetable—foul, overdried and overheated air, and darkness. Precautions against these, for the sake of plants, will be of great benefit to the inmates of the house; large house-gardens have often saved more than their cost in reducing the demand for physicians and medicines.

THE CHOICE AND CARE OF INDOOR PLANTS

BEGINNERS at indoor culture of plants should start by buying potted stock from florists. The cheapest, most enduring, and most floriferous plant is the flowering geranium, which may be obtained in many varieties of color; some kinds are beautiful merely through the variegations of their leaves. For indoor decoration, through foliage alone, the plant that best endures house air is the palm; this is now to be had in great variety; small specimens are cheap, and may be obtained, even by mail, from any prominent florist. They grow rapidly, and confer an air of distinction on their surroundings. The India-rubber plant, naturally a vine, but trained for indoor use as a bush or single stem, never fails to please; its leaves are very large, thick, and glossy, and they endure dry, hot air well. For a mass of foliage, however, nothing is

cheaper or of more rapid growth than the vine best known as the German ivy; so long as the earth about the roots is not allowed to become dry, the shoots will grow several inches a week, and in sunny windows the plant will often bloom, the blossoms being in small, yellowish-white clusters. The shoots of this ivy may be trained about picture-frames and over windows and cornices, but they are so brittle that great care must be observed when the plant is taken down to be washed, as will be described hereafter. A stronger and more rapidly growing vine is that of the passion-flower; it will not bloom in the house except in highly favoring circumstances, but it is a rampant grower. The variety known as Pfordii has a large, light-green leaf; Constance Elliott, with a smaller and very dark leaf, is a stronger variety.

The flowering plants most desired indoors are roses, violets, and carnations; they are also the most difficult to rear. They require more light and fresher air than can be found in residences in general; they manifest discontent with their surroundings by becoming covered with insects that are not easily disposed of; nevertheless, roses, violets, and carnations have been successfully raised in houses that have open fires, loose-jointed windows, and sunny exposure. A free-blooming plant that does not demand strong light is the fuchsia, of which there are many beautiful varieties, and all are cheap. Begonias, too, deserve the attention of any amateur; they are quick-growing and of abundant bloom; even while "resting" they are interesting through their foliage, every leaf of which looks as if newly varnished. The bloom is in panicles, or clusters, and the plant roots so readily from cuttings that the stock may be easily increased without cost. The period of bloom of new plants of the begonia or fuchsia is quite long. In a sunny window of any room that is not heated above seventy degrees, that is properly aired several times a day, the Chinese primrose and the Cyclamen will bloom for several successive weeks. The leaves of the primrose seem to resent wetting when the plant is grown indoors.

If in the house there is a window that need not be disturbed, it can be made a thing of beauty by growing two or three plants of climbing asparagus in it and training them on strings; the foliage is extremely delicate, and well-grown plants can often spare some sprays for table decoration. For this same purpose nothing is more useful than ferns, and these grow best in the coolest, least-lighted rooms, from which they can be brought for special decoration when required. The finer varieties will not endure heat, but any one can transplant and grow the "shield" fern, native and wild in almost all the States; and the leaf, when mature, contains so much silex that it will endure the air of almost any living-room.

For many reasons, the plants commercially known as "Holland bulbs" are most desirable for indoor culture by amateurs. They are cheaper than any other plants, many of them are extremely fragrant, some are entirely free of the insect enemies, and most of them are so easy of culture that only lack of water can bring failure. Their botanical structure is so simple and, at the same time, so advanced, that while the bulb is still dry it contains the flower-bud; and so susceptible is this to moisture and warmth, that many hastily packed bulbs have bloomed in their cases in the depths of a steamship's hull while en route from Holland to this country. Like most other plants, they detest the hot, dry rooms and stale air in which some human beings exist, but unless killed by thirst they will, in their proper time, bloom anywhere, whether in darkness or daylight, in heat or in any cold that is not below freezing. Extreme heat will cause their stems to droop, their flowers to fade rapidly, and their leaves to elongate and bend; but there will be no diminution in the number of flowers or in the volume of perfume.

Holland bulbs—which are imported in early autumn and remain fit for use until New Year's Day, perhaps longer—may be purchased and planted by any amateur, and cared for with little or no trouble until they are ready to bloom. In appearance they greatly resemble onions of different sizes. They will grow in any soil, or even in water, yet will repay special treatment according to suggestions given on following pages.

The leader of this class of bulbous plants is the hyacinth, the florets of which may be had in many shades of any color but green. In most varieties the bulb sends up a single stem, which has from twenty-five to fifty florets. In some varieties, and especially the Roman, the bulb sends up several stalks, each displaying a few small florets, of high perfume. The single varieties are preferable for house culture; double florets seem to require cooler, moister air. Prices of hyacinths vary according to size of the bulbs and comparative rarity

of varieties, but good, standard kinds, and of average size, may be had at ten cents each or a dollar per dozen; unnamed bulbs sell by the dozen at five cents each; and professional florists usually content themselves with hyacinth bulbs costing not more than two cents each by the hundred.

Next in value to the hyacinth, for home culture, comes the narcissus family. Here the colors are restricted to yellow and white, except that one variety has a tiny circlet of red on the edge of its cup. The narcissi are divided into classes, according to shapes of flower and other peculiarities of bloom; any prominent florist's autumn catalogue will contain illustrations showing differences of size and form. The flowers differ, also, in quantity and quality of perfume; some are highly scented, while others are entirely devoid of odor.

After hyacinths and narcissi, the amateur should pay some attention to the tulip, selecting double varieties, unless he has a cool room in which to forward his plants. Tulips are unequaled for brilliancy of color and perfection of form, but the latter, in the single varieties, is quickly marred by heat and by dry air. Insect pests seldom or never appear on the hyacinth and narcissus, but they delight in the tulip, although very rich soil usually prevents their appearance. Were it not for its attractiveness to insects, the crocus would also be a valuable bulb for indoor use. Freesias, scillas, and snowdrops are also likely to become covered with insects when grown indoors. All bulb dealers advertise the ranunculus and anemone, but not one amateur in a hundred ever succeeds in coaxing flowers from these roots indoors. Aside from Holland bulbs, there are two bulbous plants—the "Bermuda" lily and the Lilium longiflorum—that should be planted in autumn and that usually do well indoors.

Bulbous plants will root and bloom in any kind of soil except stiff clay; most of them will do fairly well even in water, but to get the best results the soil should be both light and rich without rankness. If potting soil can be purchased from a florist it will answer the purpose, particularly if the florist pays special attention to bulbs. Amateurs who must prepare soil for themselves may try any of several ways, according to the materials available; the best plan is to mix equal parts, by weight, of leaf-mould or genuine muck, sand, and thoroughly rotted manure; if the latter is at all "fresh" it should not be used, for bulbs are ruined by any stimulation that is not gentle. If leaf-mould or muck can not be had, use the best garden soil obtainable; well-rotted turf is so desirable, instead, that many amateurs begin a year in advance to prepare it, but it can seldom be had to order. If sand can not be got, use sifted coal ashes to lighten the soil. The soil should be sifted or otherwise handled, so as to make sure that worms are excluded.

Bulbs will do fairly well in boxes, tin cans, or any kind of crockery; but they flourish best when planted in ordinary flower-pots. These should be soaked before they are used; if they are old, they should be scrubbed, inside and outside, to clear the pores, for no plant does well in a dirty pot. For one ordinary hyacinth, or large narcissus bulb, the pot should be not less than four inches in diameter at the top; five inches is a better size. In potting a hyacinth, fill the pot with earth, scoop a hole in the centre and bury only the bottom half of the bulb; this is to prevent the bulb from opening and sending up several small flower stalks instead of one large one. A narcissus bulb may be entirely covered, or a portion of the blossom-end may remain exposed if the pot is small. In a five-inch pot three or four tulips may be planted, close to the side of the pot, with their tops entirely covered. Any lily bulb larger than a hyacinth should have a six-inch pot and be covered to the depth of an inch.

After planting, water thoroughly and set the pots in a dark corner of a cellar, or in a dark room or closet, otherwise the tops will start before the roots and the bloom will be small. For more than a month they will require no attention but a thorough watering about once a week.

More satisfactory than potting, to persons who can buy bulbs freely, is to use seed-pans. One of these, made of ordinary pot-clay, but far wider in proportion to depth, and ten inches in diameter, will accommodate half a dozen hyacinths or large narcissi, or a dozen tulips; the cost will be less than that of six pots and the effect much finer. All bulbs planted in a seed-pan should be of the same variety, so that all may be of equal height as well as of the same period of blooming.

In ordering hyacinths, the novice will do well to leave the selection of varieties to the dealers, specifying that they are for indoor planting. Roman hyacinths should be named if wanted, for they are a class by themselves; they are cheaper as well as smaller than the Dutch hyacinths proper;

they have the special merit of blooming several weeks earlier than other varieties, and of producing flower-clusters small enough to wear. Three of them may be planted in a five-inch pot. They are sold by color, not by special name; they may be had in yellow, pink, rose, light-blue, and white, the latter being the earliest.

Hyacinths grow freely and bloom well in water alone. Glasses made for the purpose should be used; they are in several shapes, the best and most effective in appearance being of what is known in the trade as "Tye's shape"—a low vase with a broad bottom. The glass should be so nearly filled with clear water that the top of the bulb almost touches the surface. The glass should be set in a dark, cool place until the roots reach the bottom; then it may be brought to the light. A hyacinth grown in water will be useless for subsequent planting; potted hyacinths may be used a second year, but their bloom will be smaller.

Hyacinths in pots should remain in a dark, cool place until the leaves are well started and the flower-head has been forced so high that the stem may be seen. When brought into rooms they should be kept from the sun and strong light for several days. At first their leaves and buds will appear pallid—almost white—but they rapidly regain their proper color. They should also be placed in saucers or trays, which should never be without water while the plants are in bloom. They do not require sunshine.

The narcissi should receive the same general treatment as hyacinths, except that they may be brought to the light earlier, for as their flowers appear at tips of long stalks they can not easily bloom before getting above their sheathing of leaves, as hyacinths will do if too soon exposed.

Not all the narcissi do well indoors. One of the best varieties for beginners is also one of the cheapest and is of rich fragrance; it is called the campernel, and bears two or more large, single yellow flowers on each stalk. By the dozen it costs about two cents per bulb, or one cent by the hundred. Three may be planted in a five-inch pot or a dozen in a ten-inch pan, and each will send up several flower-stalks in succession. The campernel is of the jonquil class, which contains also the single and double jonquil, both yielding small flowers of exquisite perfume; half a dozen of these may be planted in a single pot. Of "show" varieties, more remarkable for beauty and size than for fragrance, the finest are Emperor, Empress, Golden Spur, Horsfieldii, and Sir Watkin; they cost from ten to twenty cents each, and will delight any one who plants them. They should have about as much space as hyacinths. Cheap and satisfactory double varieties are Orange Phœnix (white) and Von Sion (yellow); either costs about five cents per bulb.

All amateurs should try the water narcissus, commonly called the "Chinese Lily"; the bulbs, which are very large and cost about ten cents each, should be set on stones in a pan or dish of water, singly or several together, with bits of stone about them to keep them from moving. Each bulb throws up several stalks of fragrant flowers, and the foliage remains luxuriant and ornamental long after the flowers have faded.

Still another section of narcissi—the polyanthus, or many-flowered—is cheap and interesting. All the narcissi—except the so-called Chinese Lily, which does not bloom a second time—improve with age, the bulbs slowly increasing by division.

The flower-stalks of bulbs should be cut away as soon as the bloom fades and water should be given more sparingly; the plants will be ornamental, through their foliage alone, for several weeks, but they can at once be removed to cellar or elsewhere if their places are needed for blooming plants. When the leaves begin to turn yellow, water should be almost entirely withheld. In the late spring the leaves and roots will have died; the bulbs should then be taken from the earth and kept in as dry and cool a place as possible until the following autumn.

The blooming season of even a small collection of bulbs may be made to extend over almost half a year by successive plantings. If some bulbs are purchased and planted as soon as they reach the market (in late August or early September), some of the white Roman hyacinths may be hurried into bloom at Thanksgiving by bringing them to the light three weeks after planting. Others will rapidly succeed these, after which will bloom the Chinese lilies, followed by other narcissi, which will be succeeded by early varieties of the Dutch hyacinths. Successive plantings in mid-October—at Thanksgiving and at Christmas—will provide for succession. From a dozen hyacinths or narcissi of various

kinds, planted at one time, not more than three plants are likely to endeavor to bloom in a single week. Of all the bulbous plants named, tulips are of slowest growth.

All house-plants mentioned above, whether bulbous or otherwise (except the primrose), need and deserve an occasional washing to remove dust from their leaves and stems. The best method is to place pot and plant in a bathtub or washtub and sprinkle thoroughly; any method of sprinkling will answer, although the work can be done easiest and best with the rubber bulb sprinkler that is made for the purpose.

A sharp watch should be kept for insects, although not many of the plants above named are subject to them. The most common one is the plant-louse, a light-green bug a little larger than the head of a pin; it appears first on the youngest, tenderest shoots of soft-wooded plants and vines and multiplies with great rapidity. It may be banished by frequent use of a strong decoction of tobacco—say an ounce to a quart of hot water; this water, when cold, can be applied to the affected parts of small plants with a camel's-hair brush. Should the plant be large and badly affected, it should be sprinkled with tobacco solution or dipped in it.

Many lovers of indoor gardening are tempted to try the culture of the dainty, delicate orchid. Unless the amateur thoroughly understands this seductive plant, or can secure the frequent advice of one who does, he will do well to leave the orchid alone. Even the commonest varieties perish without the most constant and skilful care. The rarest varieties are not only perishable, but very expensive. This plant should not be purchased except by the amateur who has both a great deal of time and of money to devote to the pursuit of his fad.

HEALTH HINTS FOR WOMEN

MUCH attention has been bestowed in recent years upon the various means of improving the personal appearance. Skilled physicians, chemists, and surgeons have devoted their attention to a subject formerly left to quacks and charlatans, and the work of preserving or restoring beauty has been brought within the province of legitimate practice.

A brief consideration of the nature and functions of the skin will demonstrate the relationship which exists between a healthy and pleasing appearance and the health generally. The primary purposes of the skin are the protection of the external surface of the body and the support of the internal organs. The sensations are also realized by us through the nerves by means of the skin, which also supplements the lungs as an organ of respiration. It has powers of absorption and secretion, and in its filter-like capacity acts as a purifier to the entire system. By means of perspiration it regulates the heat of the body and keeps it at an almost equable temperature. It will thus be seen how imperative it is in the first instance to keep the skin in a healthy and active condition.

The heart in pumping the blood through the system forces it outward to the skin, at which point it becomes charged with oxygen and distributes this vitalizing agent through the body, repairing by this means the continual waste of the fabric.

The microscope reveals millions of small thread-like tubes, known as capillaries, which penetrate from the surface inward to all parts of the body, forming the most delicate mechanism imaginable.

It is therefore easily seen that cleanliness is as essential to health as to beauty, and that the bath is the most important of all things as an aid to securing both.

To daub up the face with cosmetics without most thoroughly washing it is to invite the very ills which the person so doing is attempting to shun. In fact, as a rule, most of the preparations upon the market for treating the skin are dangerous, and many a complexion has been ruined by the use of them. The greatest discretion should be practiced in dealing with the skin, for nothing is so easy as to ruin forever a complexion which by the proper means might have been made either tolerable or beautiful.

There are any number of formulas, the ingredients of which are pure and harmless, and these often prove efficient in various ways. They can be put up by any good druggist, and will be found not only beneficial, but far more economical than the patent nostrum.

BENEFICIAL TREATMENTS AND EXERCISES

THE BATH

THE fundamental point in the ethics of beauty being the path, it may be well to make a few remarks at the outset in regard to bathing.

It has been found that while the cold plunge bath is suited to some constitutions and skins, the warm bath is more advantageous to others. In this respect, therefore, one must follow the needs of his own particular case; for no consideration, however, failing to use one or the other with regularity. If the bath be omitted the pores of the skin become clogged up, and its natural purpose of expelling the waste of the system is interfered with. The circulation of the blood is impeded, and neither health nor good looks can be expected to come from any system of treatment.

For persons of a hardy constitution the cold bath is most desirable. It should, preferably, be taken in the morning immediately upon arising. When the spray or plunge can not be borne, a good sponging from head to feet can be resorted to. The skin should be dried by rubbing with a rough towel, which will give the blood a healthy rousing and bring all the organs into activity.

The hot or warm bath has its purposes as certainly as the cold bath.

Persons with delicate constitutions, and those suffering from over-fatigue, find it very beneficial; in the latter instance relaxation of the muscles is produced and the body prepared for a healthy sleep.

In cases where a dry hard skin is the cause of annoyance, the hot bath will be found invaluable, and its regular use is recommended.

The objection to a too frequent use of the warm bath is that it is enervating, and especially so when a long time is spent in the water. Unlike the cold bath, it does not stimulate the skin and its accessories to healthy action, and when used to excess it causes the epidermis to become wrinkled and flabby. The warm bath decreases the circulation and impairs the nervous force also, making those who indulge in it very susceptible to atmospheric changes.

The top of the head should invariably be wetted first when the entire body is to be immersed.

The rationale of the bath is one of the most important things to have clearly understood. A distinguished English physician says of it: "Doubtless, when judiciously employed and when a proper glow follows, it is a beneficial tonic. The blood, driven from the surface by the contraction of the blood vessels, is returned to the heart and the circulation is quickened. But where no reaction takes place, where the skin remains blue, the cold bath has done positive mischief, and the next time tepid water should be used. The truth is that warm and cold water have *precisely the same results* in different people. In the strong, cold water secures a reaction, and the same warmth is obtained as is obtained directly and without reaction when a less sturdy person uses warm water. The effect is to quicken the circulation. In one case the blood is driven in upon the internal organs, which in their turn propel it again to the extremities; and in the other case the blood is drawn to the surface and extremities, the vessels in the skin being relaxed and opened by the genial warmth. And I would remark that in cases where there is a tendency to lose the hair the friction with the rough towel that is so useful in assisting circulation after a bath, and therefore so salutary to the skin, is by no means advantageous to the hair, which it loosens and causes to fall in greater quantities."

A hard cracking skin can not receive too much moisture, and the latest method of treating extreme cases of this kind is to subject the patient to complete immersion for weeks and months at a time.

The thin, delicate, sensitive cuticle, on the other hand, can be speedily harmed by injudicious excess in the use of the bath. Hard water or alkali soaps will often produce cutaneous trouble, the true cause of which will be unsuspected by the sufferer.

Rain water, or water softened by the addition of a few drops of ammonia, and distilled water, are also very soothing and agreeable to tender skins. Among the varieties of soap which are desirable, white castile probably ranks first. In making this soap, olive and linseed oils are combined, the other ingredient being poppy or ground nut. Palm oil, castor oil, and cocoanut oil soaps are also favored by dermatologists.

In order to wash the face properly a lather should be made with soap and warm water, which should be rubbed in with the hand preferably to using a towel or flannel. The face should next be washed with tepid water until every particle of soap is removed, and then finally a bathing with cold water should complete the operation.

In order that the constitution of the skin and its organism may be perfectly comprehended, it may be stated that, according to scientific analysis, complexion is known to be the result of a certain arrangement of pigment molecules. This molecular deposit develops from the blood by a certain chemical process, and in due course forms the hue of the complexion, hair, and eyes.

Dark and light complexions are due to the greater or less amount of this pigment deposited by the system, the former being due to the excess of the molecules.

We thus find that the various styles of complexion are due to the greater or less quantity of blood driven into the small vessels near the surface of the skin, and to the character of the blood.

Paleness or flushing are due either to the abrupt contraction or expansion of these channels, caused by the action of the nerves upon them, whose function it is to regulate the condition of the epidermis.

PHYSICAL EXERCISES

The pallid, sickly looking person is never addicted to indulgence in physical exercise. Beauty as it is admired to-day bears the insignia of health, and rosy cheeks will win more appreciative glances than sallow ones. Hygiene is therefore so closely allied to the question of preserving personal charms that it enters at every stage into the curriculum. The languid and sentimental miss of a quarter-century ago has given place to a style which is more dashing than it is statuesque, and more inclined to go to the extremes in an opposite direction. There is no doubt that the race is a gainer by the change, both in appearance and health.

The question of physical exercise is much like that of the bath, depending to a large extent upon the constitution of the individual.

Many women find bicycling to be beneficial in the highest degree, while others become physical wrecks from the use of the wheel. Outdoor exercise of some kind is of course essential to perfect health and its usual concomitant, beauty.

At certain seasons of the year and under certain circumstances it may not, however, be convenient to indulge in it as often as desirable, and there are also other reasons of a more general character for the practice of those exercises which come under the classification of calisthenics.

For the expansion of the chest the following simple movement has been devised: Upon arising from bed walk several times briskly round the chamber. Next stand in as absolutely erect a position as possible, extending the arms backward and forward from the shoulders to their full length for a number of times.

This movement should be executed slowly and no unusual exertion is necessary. The breath should be drawn gently through the nostrils while the exercise is being taken. The next thing is to drop the hands straight down beside the body, raising them slowly and extending them outward until the motion brings the finger-tips together at the top of the head. This movement should be repeated several times, and may be followed by another one equally simple. Place the hands upon the hips first, and then stretch them out straight, bringing them together in front by a meeting of the tips of the fingers. The same movement can be practiced in the opposite direction and the fingers made to meet at the back.

A better movement still is supposed to be the following: Assume an erect pose and elevate the arms over the head. Keeping them straight outward, bend the body forward until the finger-tips, descending, touch the floor. This can be repeated as many times as will not fatigue. Follow this by returning the body to its erect posture, and, using the base of the body as a pivot, turn it at the hips as far both to right and left as possible without changing the position of the feet. Again resuming the vertical poise, lean the body alternately to left and right a number of times and as far as possible without losing the balance. A finishing touch is to lift one knee at a time as high as possible and swing it back and forth in the hip

socket. This movement will lend suppleness to the joints and consequent gracefulness to the carriage, besides promoting the general health.

One of the most valuable exercises for the development of grace and symmetry is fencing, now so much practiced by women. Too much can not be said in favor of this diversion, which brings into play all the muscles of the body and trains both eye and hand to unerring accuracy.

Dumbbells may be used to great advantage by women, but their weight should not exceed one-half to one pound, nor should they be used for a longer period than ten minutes, once or twice a day.

The art of being graceful is one of the most difficult to acquire, either by women or men, and the only royal road to it is by means of a course of calisthenics.

Suppleness of the joints may be secured by using an ointment composed of venison fat, eight ounces; musk, one grain; white brandy, half a pint; rosewater, four ounces. Rub on at bedtime and remove with a sponge and water in the morning.

Women who wish to reduce weight can not do better than use some form of the many "exercisers" that are sold in the stores that deal in athletic goods. These "exercisers" consist of an arrangement of



Fig. 1.



Fig. 2.

pulleys, elastic bands and handles, and are intended merely to give zest and a notion of resistance in exercises that might as well be pursued without apparatus.

Figure 1 depicts what is termed the "alternation." Standing with the back to the exerciser, the arms are lifted, in turn, over the head, and back again. The body should not move during this operation. There is no royal road to the reduction of obesity, but the use of these movements week after week acts upon the arms, the chest, the abdominal and intercostal muscles.

There is more fatigue, though no less benefit, in the exercise shown in Figure 2. Standing with back to the exerciser, and with some tension, bend the arms forward



Fig. 3.

until they are horizontal, then throw the hands backward over the head, bending the body as far backward as possible, throwing the head backward at the same time. At the beginning, ten of these movements will suffice, but the number may be gradually increased to from fifty to one hundred times, according to the strength of the subject.

Without a doubt the severest and most beneficial exercise, if persisted in, is the one pictured in Figure 3. Stand with heels together, toes forty-five degrees apart. Throw the hands, together, over the head as far backward as possible. Still keeping the hands together, but without bending the knees, bring the hands down so that they touch the floor. While it is at first impossible to so touch the floor, practice is necessary for a few days only before it is possible to make the complete manœuvre from thirty to fifty times in succession.

"Swimming," as explained by Figure 4, is another useful exercise. It is performed preferably with an "exerciser," although it may be done without apparatus. In the former case, with one foot forward, bend slightly to the front, and imitate with the arms the movements of swimming. The abdominal and side muscles are brought greatly into play by this work.

All the above movements should be carried out with the utmost gentleness. The tendency to rough or severe work must be suppressed from the start. When any one of the foregoing exercises has been carried

to a point where the subject finds herself inclined to pant she should desist until after a satisfactory breathing spell has been indulged in. All these exercises are vastly more beneficial when the room is filled with the greatest possible abundance of fresh outdoor air.

Exercise of a fitful kind, taken once in a while, is effort wasted. Each subject must determine how much she can endure daily, and she should follow this schedule regularly, if at all.

Strange as it may seem, the road to the increase of weight is also through exercise. Yet it must be remembered that, while the body should be active, the mind must be as much as possible at rest. Thin women, who are excessively nervous, and



Fig. 4.

who can not crush out this tendency, will strive in vain for rotundity. Mental stress must not be attempted by the woman who seeks increase of weight. Absolute rest after meals is requisite, and at least two short naps a day should be taken. The slender woman in quest of greater weight must dodge extra fatigue and hurry as she would the pest. Insomnia at night must be provided against; a light lunch of crackers, combined with applications of cold water to the head and neck, will generally prove efficacious.

Sugar, fat meat, soups, candy, cornstarch, tapioca, chocolate, milk, cream, eggs and butter should form important items of diet. Yet while paying due attention to dieting, it must not be forgotten the greatest aid to weight is the possession of a contented mind.

THE STANDARD OF BEAUTY

The ancients regarded the Venus de Medici as the true standard of proportion in form and feature. Her measurements were as follows: Height, 63 inches; breadth of neck, 4 inches; of shoulders, 16 inches; of waist, 9½ inches; and of hips, 13 inches.

The standard upheld by the Berlin Royal Academy of Arts varies slightly from this. Its measurements are: Height, 63½ inches; breadth of neck, 3¾ inches; of shoulders, 15 inches; of waist, 9 inches; of hips, 13½ inches.

The composite measurement of the American college girl is as follows: Height, 63½ inches; breadth of neck, 3.8 inches; girth of neck, 12.1 inches; breadth of shoulders, 14.7 inches; breadth of waist, 8.6 inches; girth of waist, 24.6 inches; breadth of hips, 13.1 inches; girth of hips, 35.4 inches; girth of upper part of arm, 10.1 inches; girth of thigh, 21.4 inches; and of forearm, 9.2 inches.

The rules given for assuming the proper posture and attitude while in a standing position are as follows: In the first place the corresponding halves of the body must be in the same anatomical relation, the centre of gravity of the whole body falling just in front of the last lumbar vertebræ. In order to admit of this pose being the natural one, and capable of being sustained for the greatest length of time without inconvenience, there must be perfect symmetry of the bony structure and an equal development of the muscles on the back and front of the body. Any exercise which tends to bring about an unequal development of the muscles will have a deterrent influence on the health and gracefulness of the body. Such physical defects as curvature of the spine, drooping shoulders, and oblique poise of the head are due to this inequality or to structural malformation.

It is within the province of the physical trainer to remedy any irregular muscular development, and the latter ills, which are mostly deformities at birth, are now frequently remedied by the aid of surgical skill.

The normal weights in proportion to the height of the body of any individual are as follows:

5 feet tall, 120 lb.
5 feet 1 in., 125 lb.
5 feet 5 in., 145 lb.
5 feet 8 in., 160 lb.
5 feet 10 in., 170 lb.
6 feet, 180 lb.

A scale has recently been compiled for infants, as follows:

At birth,	7 lb.	24 weeks,	14¾ lb.
2 days,	6 "	26 "	15 "
4 "	6 "	7 m'ths,	16 "
7 "	7 "	8 "	17 "
2 weeks,	7½ "	9 "	18 "
4 "	8 "	10 "	19 "
6 "	9 "	11 "	20 "
8 "	10 "	12 "	21 "
10 "	10¾ "	14 "	22 "
12 "	11½ "	16 "	23 "
14 "	12¼ "	18 "	24 "
16 "	12¾ "	20 "	25 "
18 "	13½ "	22 "	26 "
20 "	14 "	24 "	27 "
22 "	14½ "		

Many malformations which were formerly considered incurable can be easily overcome while the child's bones are soft and the muscles flexible. The number of cripples can, owing to the advance in surgical science, be greatly reduced by prompt attention to these natal defects, and years of after torture can thus be avoided for the unfortunate victim.

COSMETICS AND THE COMPLEXION

The preparations advertised by quacks for remedying defects of the complexion are as a rule worthless, and generally cost many times the intrinsic or market value of the ingredients.

The two radical remedies which the chemist offers for this purpose are the astringent and the emollient. The dry, hard skin, which results in many minor surface disorders and abnormal desquamation finds its remedy in the latter, while the wrinkled, flabby, and tender skin will be remedied, at least superficially, by the application of an astringent.

The principal astringents are the acids, alum, lime-water, chalk, and certain preparations of copper, zinc, iron, and lead. The last four metals, and, indeed, all metals, are dangerous to the true health of the skin, and their use is to be discouraged.

Emollients are derived from natural oils and fatty substances.

The basis of most of the astringent preparations on the market is either alum or corrosive sublimate.

Neither should be used except by direction of the family physician.

The indiscriminate use of corrosive sublimate has ruined the complexions of thousands of unfortunate victims of irresponsible nostrum venders.

Peroxide of hydrogen and sulphur are new agents in the treatment of the complexion.

The value of sulphur used both inwardly and externally has long been known to authorities on the skin.

Peroxide of hydrogen is of more recent introduction. Although known in chemistry for nearly a century it has only of late years become popular in the hands of the dermatologist.

Brown patches and discolorations of all kinds which will yield to no other treatment can be removed by its use. Many forms of cutaneous trouble that can not be reached by other agencies yield to this drug, which is also used for bleaching the hair, finger-nails, hands and other parts which are stained or discolored from any cause. It is an antiseptic, and has been used internally for diphtheria, as well as for many other purposes.

The greatest care must be taken in using this chemical, so that the eyebrows and hair are not touched, as it will immediately bleach them white.

The desideratum in the way of complexion is a firm, healthily tinted skin, and the frequent use of cold water will do more to secure it than anything else when the cuticle is fairly healthy. The face should be dried first with a rough towel and then gently rubbed with a chamois leather. Warm water is best used when the face is not going to be immediately exposed to outside air, and should be as tepid as possible under such circumstances, because the hotter it is the more it contracts the pores and prevents healthy action of the skin.

A glycerine or almond soap used in washing will prepare the skin better for exposure outdoors, and a little powdered chalk may be used without detriment.

When returning to the house, in order to remove all traces of perspiration a little borax may be added to the water used for washing in. It does more than this, leaving a soft, white glow to the skin which it acts upon in all ways beneficially.

Care should be taken not to indulge in too frequent ablutions, as the skin is extremely susceptible and is not benefited when healthy by absorbing too much moisture.

Sun baths, with the whole body absolutely exposed to the unrestricted rays, can not be too highly recommended, the effect being to increase the elasticity of the skin so necessary in preserving the perfect contours. For very oily skins a little tincture

of benzion dropped in the water will be found beneficial, and alum can be used when necessary to stop temporarily a too profuse perspiration. A prescription which has been advantageously used in such cases is the following: Blanched Jordan almonds, one ounce, blanched bitter almonds, three drams. Put these into a pint of distilled water, form into an emulsion and then strain. To this add fifteen grains of corrosive sublimate dissolved in another half-pint of distilled water. Yet this emulsion should be used only on a physician's advice.

The following will be found a cheap and harmless bleach for the face and neck: To one pint of distilled water put ten grains of powdered corrosive sublimate. When fully dissolved add an ounce of pure glycerine. This may be used two or three times a day.

The following formula for an astringent skin lotion is also recommended by some chemists: To four ounces each of white wine vinegar and rosewater add half an ounce of dried rose leaves. Dilute with distilled water.

Oily skins need an astringent lotion made up as follows: Benzine, four ounces; rosewater, two ounces, and five grains of alum.

Cold cream for tender face and lips may be made as follows:

One ounce of pure white wax melted in four ounces of oil of sweet almonds over a very slow fire, to which add gradually a quarter-pint of distilled rosewater, stirring until cold.

Care should be taken to study the character of the skin so that proper treatment may be applied to it.

Every woman can under ordinary circumstances be her own complexion specialist, but the treatment must be appropriate to the case or successful results will not be achieved.

Cocoa buttermilk, which is much used by some ladies, can be made from the following: Powdered borax, 2½ drams; powdered castile soap, 5 drams; cocoanut oil, 2 ounces and 2 drams; distilled water, 2 fl. ounces; rosewater, 26 fl. ounces; oil of bergamot, 10 drops; oil of neroli, 5 drops; oil of wintergreen, 12 drops; oil of ylang-ylang, 1 drop; oil of almonds, 1 drop.

The first four articles should be pounded together in a mortar for ten minutes, then the rosewater be gradually poured on, the mixture well compounded, and perfumes subsequently added.

Compared with the simpler methods used for bleaching the skin in the present day some of the old-time formulas appear to be very elaborate. The following was a favorite formula at the Spanish court:

"To a pint of white wine vinegar put a full handful of well-sifted wheat bran, steeping it for several hours, and adding the yelks of five eggs with two grains of ambergris. Distil, and bottle for fourteen days. Use when making the toilet, and a polished whiteness of the complexion will ensue."

For a dry, hard skin, lanoline, which is made from the wool of sheep, is now extensively used in various combinations, commonly known as skin food. Mutton tallow is a fair substitute for lanoline, but not so rich in animal oil. These should be used at retiring, being rubbed gently into the skin until the cuticle is thoroughly impregnated.

To produce a bright and rosy complexion the following formula should be used: One ounce of powdered benzoin, soaked in four ounces of alcohol for a week and filtered, then added to a pint of water.

A skin lustre which can not be surpassed is much used in St. Petersburg. The formula is given by a Russian court beauty. It somewhat resembles one previously stated. Take a pint of white wine vinegar and four ounces of sifted wheat bran. Allow the bran to infuse for four hours, then add the yelks of four eggs and two grains of musk. Apply at night, and when the morning bath has been taken the skin will be bright and polished like ivory.

Delicate skins suffer greatly from sunburn, and much inconvenience is experienced if proper treatment is not given. In the first place, washes of a cooling and evaporative nature should be applied on cloths, which will require constant changing until the heat is all drawn out of the cuticle. Lime juice or lemon juice mixed with either milk or cream should be used during the night to bring the skin back to its normal condition. The cocoa buttermilk, or even plain buttermilk, will be found beneficial where the burn is not severe.

Another remedy for sunburn which can be used in place of the previously described treatment is as follows: Two drams of borax, one dram burnt alum, one dram camphor, half an ounce of sugar candy, one pound of ox gall. Mix and stir these well for ten minutes and repeat the stirring three or four times a day for two weeks. When it becomes clear and transparent, strain through blotting paper and bottle for use.

A much simpler prescription is made from the juice of a lemon combined with half a teaspoonful of borax dissolved in an ounce of distilled water. This may be used frequently, and steaming the face is advised in order to prevent the sunburn from becoming permanent.

In order to steam the face, take a basin filled with boiling water and drape a towel over the head so as to prevent the steam from escaping when the face is held over the water.

The steaming should be the first treatment, and if the burn is painful a careful rubbing with good cold cream will relieve it.

Perhaps the simplest and most easily obtained sunburn remedy is talcum powder. In ordinary cases it is all that is necessary.

Freckles are another source of annoyance to many women.

Buttermilk taken fresh from the churn will sometimes destroy them. It should be spread over the face after the manner of a plaster and allowed to remain on for several hours, if possible. Remove it with warm water and see that the skin is carefully dried. To secure a cure several applications may be necessary.

A famous French prescription for removing freckles is composed of "green soap," one ounce; lemon juice, half ounce; oil of bitter almonds, quarter ounce; pure oil of lavender, quarter ounce, and three drops of rhodium oil. Dissolve the soap in the lemon juice and add the two oils. Place in the sun until an ointment results and then add the rhodium. Anoint the face nightly and cleanse in the morning with a mixture of elder-flower and rosewater.

Other simple prescriptions for freckles are lemon juice with salt dissolved in it, or a combination of glycerine and benzine, both of which are to be used after washing the face at night before retiring.

An excellent formula for tan or freckles is made as follows: Four ounces lactic acid, two ounces glycerine, one ounce rosewater. Apply several times a day and supplement with a cream made as per formula: Four ounces almond oil, one ounce each white wax and spermaceti. Melt together and gradually add three ounces of rosewater and one ounce witch-hazel. Stir ingredients until an emulsion is made, then allow to cool. Make the applications less frequent if this lotion is too strong for the skin treated.

A simple pomade for the cure of tan is made from equal parts of lemon juice and white of eggs stirred slowly over a slow fire and used night and morning. Washing with rice water will hasten results.

Women who desire to possess anything like a clear and healthy skin should carefully avoid the use of certain drugs that are only too commonly used by some members of their sex. The use of arsenic for the complexion is productive of boils and carbuncles. To persons with delicate skin and fair complexion it causes desquamation of the skin on the parts of the body covered by clothing. It is generally detrimental to the health, although it lightens the pigment on the face and hands.

Acne and other pustular eruptions and detrimental results to the hair have been traced to the continued use of bromides, which many women take for sleeplessness and some nervous affections. Since, however, the appearance of these disfigurements indicates an impure state of the blood, it is far better to consult a reputable physician, allowing him to prescribe for the disorder than to use unguents or ointments for the skin. Such direct applications, unless of the simplest character, are liable to increase, rather than diminish, the eruption.

TREATMENT FOR WRINKLES

The question of wrinkles is a most serious one to all women sooner or later in life. That they can be dealt with satisfactorily by several methods is a matter of self-congratulation to the sex generally.

The primary cause of wrinkles is the relaxation of the muscles of the face and thickening of the epidermis, combined with decrease of cellular tissue.

The replacement of this cellular tissue by artificial means and the strengthening of the facial muscles are fundamental points of treatment.

The outer layers of the skin are, in young and healthy persons, being constantly renewed. While the circulation of the blood remains active, tissue is renewed continually, and the skin performs its work, showing no degeneration in either its functions or appearance. When this machinery becomes clogged, the opportunity for the deadly wrinkle to appear occurs. There is but one thing to be done by the person who is particular as to a comely appearance, and that is to fight the intruder by every means known to the dermatologist.

The simplest method of doing this is the application of astringent lotions and creams; the most elaborate is electricity. Massage is a useful means, often successfully employed at a stage when the crowsfeet have

got beyond the possible help of the astringent. It is more commonly employed than any other system of rejuvenation.

Facial massage can not be performed so well by one's self as by another person, and a practical masseur at that; however, with patience and the aid of a mirror, much can be done to subdue the wrinkles.

In manipulating the face a firm and gentle touch is necessary, and the tips of the forefinger and thumb only should be used. The motion of the finger-tips is always outward and never receding. For instance, when the wrinkles are on the forehead an upward stroke is necessary, because the contraction of the skin in that direction is needed to offset the expansion which has produced them.

The location of the facial muscles must first be determined, and along their lines in a contrary direction passes must be made for at least half an hour each day.

Massaging around the mouth and eyes is performed by a circular movement. To bring out fulness of the chin and cheeks upward and lateral movements are correct, in the latter case proceeding outward from the nose toward the ears.

It will take long and persistent operations to remove well-established wrinkles, and professional masseurs invariably use skin food and other ingredients in the course of their manipulations.

Before commencing operations, the pores of the skin should be thoroughly cleansed and opened, so that the skin food can enter through the orifices and sink into the



Fig. 5.

fatty glands, where it is intended to supplement the failing supply of nature and furnish material to develop new muscle and tissue.

The best skin food is made as follows: Three ounces of lanoline, three ounces of sweet almond oil, one ounce of cocoa butter, a dram each of spermaceti and white wax. These should be melted together over a quick fire, in a metal vessel, and pounded into a fine paste, to which forty drops of benzoin tincture and a few drops of essence of jasmin should be added. The latter is intended as perfume. Almond oil can be substituted for the cocoa butter, and any essence will do in place of the jasmin, which has an agreeable odor. This prep-

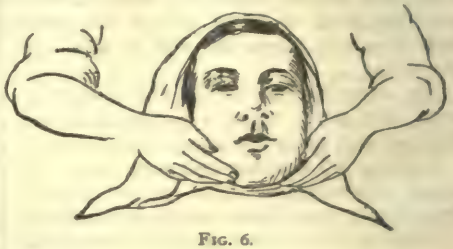


Fig. 6.

aration may be used as the unguent, or a special one may be made by melting nine parts of lanoline and two parts of sweet almond oil, these latter ingredients to be stirred continuously from melting-point to solidification.

It is of little benefit to use either preparation without the massaging process, as merely spreading it on the face will do little or no good.

When the unguent has been applied, and well rubbed in, the operator should give a steady, gentle upward rubbing with the tips of the first and second fingers, first together and then in alternation. (See Figure 5.)

Perhaps no feature of overstoutness is more distressing than the double chin. At the first sign of appearance of this blemish, one of the unguents above mentioned should be liberally applied. The first movement of massage consists of a lateral movement of both hands, as portrayed in Figure 6, followed by a steady kneading of the roll under the chin with the thumbs and forefingers; after this use the two hands in brisk alternation with downward strokes.

In Figure 7 a practical method is shown of eradicating "puffiness and wrinkles" under the eyes. With the second finger of each hand begin just above the inner corner of either eye, and make a rotary movement, following the little circles under either eye. The essential feature of this movement should be gentleness, and the duration should be seven or eight minutes.

After any one of these massage operations, the unguent should be removed by the application of a towel dipped in hot water, this to be followed by the use of a towel soaked in cold water, in order to

close the pores. After this, a final application may be made of milk of benzoin, the formula of which is given in the chapter on Cosmetics.

Where it is impossible to pursue this elaborate course a simpler method can be tried. If the paste of half an ounce of alum and half an ounce of sweet almonds be added to the whites of five eggs beaten up in rosewater, and the compound spread upon a cloth firmly fixed upon the face every night, for a few weeks, the wrinkles will be considerably diminished.

A beautiful throat and neck are as essential to the appearance as anything, and wrinkles not infrequently invade this conspicuous section.

In order to do away with wrinkles and scragginess below the chin, the skin food should be rubbed in assiduously; and the muscles of the throat can be strengthened better by balancing a fairly heavy package on the head and walking round the room with it there a dozen times daily than by any other means. The combined treatment

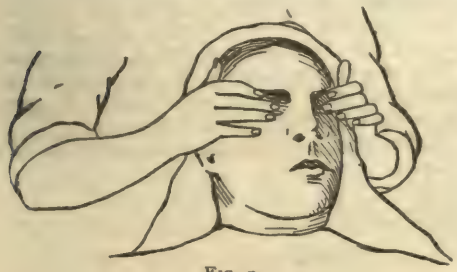


FIG. 7.

will secure a beautiful poise for the head and a throat as graceful as that of a swan.

The effect of the disposition in the production of wrinkles is exceedingly marked. A sunny and volatile temperament is the greatest preventive of them, while a scowling, fretful, and discontented nature develops them prematurely. Gum-chewing is credited with being the unwitting cause of their appearance on many faces.

The most thorough and heroic treatment for the destruction of wrinkles is by means of electricity.

This is one of the cures, however, which can scarcely be conducted at home. It requires the most skilful of operators, in order to avoid the risk of disfiguring marks which may last for life. The number of persons practicing this method safely and successfully is probably under a dozen, and American experts have been paid large sums to go to Europe and treat members of the wealthy classes there by the process. The method pursued is to apply the electric current, running from the positive to the negative pole, to the fleshy part of the cheeks, neck, or bosom.

The stimulation furnished by the current renews the healthy action of the capillary glands, gives an impetus to the flesh growth, and by this means fills the shrunken folds of skin up with healthy tissue, completely removing the wrinkles.

This treatment is costly, but produces, when skilfully given, marvellous restorative results.

A combination process is often resorted to by specialists, which includes electrical treatment, massage, and the use of drugs. One of these methods is as follows:

First a thorough massaging of the face is given, which literally pulls the wrinkles out of their places and puts the face into a healthy glow, very often producing a slight perspiration. The face is then sponged off and a skin food applied by a renewal of the massaging process. When sufficient of this preparation has been absorbed a soft cloth and some distilled water are produced, the surface being gently rubbed until all the exudations forced by the massaging process have been wiped away.

The next step is a vigorous rubbing with a tonic designed to harden the flesh, muscle, and skin. The tonic is the last thing in the morning process, and prepares the skin to withstand either winter storm or summer sun. It is an English preparation.

The evening course consists of the application of electricity, followed by washing in distilled or soft water and anointing with a cream composed of cucumber, lettuce, and other herbs, added to rosewater and cocoanut oil or butter. This remains on all night, and when it is necessary for the party treated to spend the evening out a make-up is added in addition.

This process is taken for a course of three weeks and then discontinued for some time, until the warning signs of nature suggest the necessity of its renewal.

A new method of curing wrinkles which has been introduced in the last few years consists of surgical operations, by means of which they are positively banished for a considerable time. The method pursued is simple enough. A transverse incision is made across the wrinkles and a piece of skin taken out sufficient to leave the cuticle fitting tightly over the forehead or cheeks

where the wrinkles formerly were, after the two edges are sewn together.

Provision is made to ensure the healing of the flesh without leaving a scar, and many successful operations have been made.

Wrinkles of the nose or throat are treated by means of incisions made contrariwise to the direction in which they run, the operation being little more painful than other systems.

PIMPLES AND BLOTCHES

Many women suffer untold tortures from disfiguring eruptions on the face, arms, and other parts of the body.

Some of these skin diseases are extremely difficult to handle, and tax the skill of the cleverest specialists. Others will often yield to simple remedies, careful dieting, and other hygienic precautions. As a rule, they have their origin in some organic disturbance, such as improper condition of the stomach, liver, or kidneys, which expresses itself locally through inflammation of the fatty glands, and the skin is thereby affected.

In other cases the cause of the trouble is purely local, and no amount of internal physicking will act as a panacea. Such is the case, for instance, in eczema, and several forms of pimples and sores.

Eczema is one of the most general and painful of diseases attacking the face. It is purely a cutaneous trouble, having its origin in a catarrhal condition of the skin. It is of several varieties, and manifested by a breaking of the skin, principally on the face, scalp, hands, and feet. The fissures are caused by the exudation of albuminous serum, a liquid which is produced by an imperfect development of the blood corpuscle. Intense itching is the first symptom of the disease, and the greatest care should be taken to avoid breaking the skin in scratching. When it does break, zinc ointment will heal it more quickly than anything else. The same remedy may be applied with success to blotches and sores of all kinds. A novel treatment is advocated by a prominent physician for the cure of pimples on the face. The application of remedies, he believes, should be to all parts of the body but the face, thus creating a reaction on that part of the skin where the irritation exists. His method is to sponge the body thoroughly once a week, under the bed clothes, with acetic acid, in a weak and well diluted form. In case of fever, the acid only is to be used, but when a chilliness is experienced, the body should be well rubbed with hot olive oil. At other times the skin must be kept clean with hot water and castile soap. The only treatment of the face recommended is to wash it once or twice daily with buttermilk and to restrict the patient to a light, easily digestible diet.

The use of sulphur, both internally and externally, is strongly recommended for most kinds of eruptions. A lotion made as follows can often be used beneficially for pimples: One ounce of sulphur water, quarter ounce acetated liquor of ammonia, one grain liquor of potassa, two ounces white wine vinegar, and two ounces of distilled water. Another good formula for pimples is made of: Lanoline, five grams; sweet almond oil, five grams; precipitated sulphur, five grams; oxide of zinc, two and a half grams; and extract of violet, half a gram. Pimples on the nose can be treated with the ointment composed as follows: One ounce of benzoinated lard and one dram of ichthyol. Another formula which is good for either blackheads or pimples is: Oxide of zinc, one dram; resorcin, one dram; starch, one dram; petrolatum (yellow), two and a half drams. This should be applied at bedtime in a thin coating to the affected parts. It can be rubbed off with oil in the morning.

Acne is one of the most conspicuous of eruptive complaints. Its origin is due to stomach, liver, and kidney troubles, and medical treatment is essential in connection with it.

The following are prescribed for chronic eczema: Salicylic acid, 5 grains; ichthyol, 10 grains; glycerine, 10 grains; spir. menth. pip, 20 grains; spirit lavender, 20 grains; rect. spirit wine, 60. This liquid should be applied with a brush several times daily.

If the disease has assumed an acute form: Bismuth oxid dr.j., ac. oleic oz.j., cera albe dr.iij., vaseline dr.ix., ol. rose m.ij.

For a dusting powder use: Pr. amyli oz.j., pr. zinci oxidi. dr.ij., pr. camphor dr.ss. Also try the use of pine tar soap in washing the affected parts.

Alkaline baths are also strongly recommended for these and nearly all other eruptive disorders of the skin.

Rosacea, a kind of yellow pustular formation with a deep red base occurring on the nose, cheeks, and forehead, is another common form of eruption due to stomach trouble and coming within the scope of the physician's treatment.

Warts are a common cause of disfigure-

ment to the female face. They are removed generally either with the lunar caustic pencil or by the electric needle. The following prescription can be applied night and morning: Salicylic acid, 1 part; lactic acid, 1 part; collodion, 4 parts.

Chloasma or liver spot is a yellow discoloration frequently appearing upon the face. It needs internal treatment, for which the following old-time liver remedy may prove useful: Pulv. gentian, 1 dram; pulv. Columbo, 1 dram; pulv. quassia, 1 dram; pulv. dandelion, 1 dram; spts. frumenti, half a pint.

For local treatment, rub with flour of sulphur several times a day or wash with a lotion composed of one ounce sulphur water, quarter ounce lemon juice, and one dram cinnamon.

Acne Rosacea is a similar trouble to simple Rosacea, except that it is spread beyond the nose, often resulting in a fiery red discoloration of the nasal organ and contiguous parts.

Dieting and abstention from condiments or stimulants are absolutely essential to cure. Local treatment will be of little or no service until the blood is brought into proper condition.

Flesh worms are an annoying and irritating infliction. To remove them soak the face thoroughly with soft water and apply a lotion composed of four ounces of white brandy, two ounces of cologne, and one ounce of potash solution. Use a coarse towel for rubbing the face, and the worms will soon yield to this treatment.

CARE OF THE TEETH

The preservation of the teeth is a question of leading importance when the appearance is considered, not to mention it as a factor in the general health proposition.

A set of shining white teeth, set between rosy lips, is almost as attractive as a beaming smile or a flashing eye.

Cleanliness, absolute and unremitting, is the first essential in preserving the pearl-like purity of these natural gems.

When once in good condition, a steady brushing of the teeth night and morning, and, when possible, after each meal, will keep them in proper order. Cold water is safer and better to use than the majority of dentifrices on the market. Where one is preferred, however, precipitated chalk may be used. To this can be added some ground orris root and a few drops of oil of rose.

The teeth should be cleaned underneath as well as outside, because secretions are apt to form there more than elsewhere. Two or three drops of myrrh in a half tumbler of cold water makes a pleasant wash, and the teeth should be brushed perpendicularly. Charcoal and cream of tartar are also used for tooth powder.

An excellent plan to prevent sensitiveness of the gums and to whiten the teeth is to paint them with milk of magnesia each night before retiring.

The acid deposits are what ruin the foundations of the teeth. To avoid permanent discoloration and decay, it is well to visit a good dental establishment once or twice a year and have the teeth properly cleaned. The greatest danger to the teeth comes from the lodgment of small particles of food in the interstices. These should be carefully removed with a wooden toothpick after each meal, as when allowed to remain they form acid deposits which eat into the gums and subsequently penetrate the teeth.

Tartar deposits should be closely watched, as they are the cause of destruction to the teeth unless removed promptly.

Discolored teeth may often be cleaned without danger to the enamel by brushing them well with lemon juice.

Borax is also used with great satisfaction to cleanse the teeth and harden the gums; in fact, it is an invaluable toilet adjunct for more than one purpose. Brandy may also be used safely for cleaning the teeth, as it destroys the animalculæ which serve as parasites to them. The acid of strawberries and oranges will remove stains from the teeth without producing detrimental results.

Areca nut charcoal is favorably considered by dentists as a dentifrice, as it is an excellent antiseptic.

For painless extraction of teeth the following lotion may be used. It can be applied on cotton, pressed to each side of the tooth: Oil of wintergreen, 2 drams; chloroform, 1 dram; sulphuric ether, 1 dram; chloral hydrate, 2 drams; oil of cloves, 4 drams; alcohol, 12 drams.

Cocaine and cocaine solutions are also used widely for this purpose, but many dentists prefer preparations that involve no unpleasant after-effects.

CARE OF THE HANDS

The hands are generally an indication of the degree of refinement of the individual. We can not all have long, tapering fingers, but with due care and cleanliness the hands

even of a person who is compelled to do moderately rough work with them may look well.

Here is a set of rules which carefully followed will preserve the hands even when rough housework has to be done by their owner.

In washing dishes never plunge the hands into very warm water. Use a mop, as far as possible, and wear rubber gloves; when handling a broom or doing other rough work wear housemaids' gloves with wadded palms. Clean off any stains that appear on the hands as promptly as possible. A piece of lemon is far superior to pumice stone for this purpose.

Do not wash the hands any oftener than necessary, and always dry them thoroughly. Use oatmeal in place of soap, or good oatmeal soap. Before retiring, wash the hands in moderately warm water with oatmeal. When dry, rub into them some of the cocoa buttermilk cream, according to prescription given, or any equally good cream. Then put on loose kid gloves and wear them all night.

Oatmeal is an invaluable article for the hands. It should be kept in a convenient receptacle on the washstand, and as often as the hands are washed some of it should be rubbed on, allowed to remain a few minutes and then rinsed away. Afterward an emollient cream may be used compounded as follows: White wax, spermaceti, and powdered camphor, five cents' worth each; olive oil sufficient to bring these ingredients to the thickness of soap. They can be melted and mixed in an ordinary pot on the stove and will make a good ointment for the hands.

Another recipe is: One wineglassful each of eau-de-cologne and lemon juice; two cakes of brown windsor soap scraped fine and powdered. Mix well and remold into soap cakes for whitening the hands.

For rough hands the following recipe can be used: Three ounces white vinegar, three ounces lemon juice, and half a pint of white brandy. This will heal either rough or chapped hands. Glycerine slightly flavored with rosewater is a good emollient to use for the hands at night after washing in soft warm water.

The nails are a subject of particular interest in the economy of the hand, and can be made either a disfigurement or an ornament, according to the attention given them. A soft nail-brush is essential, and should be used with soap each time the hands are cleansed.

Twice a day the skin around the nails should be pressed back with the orangewood stick furnished in each manicure set. This skin should never be cut, as it will not grow long if not developed by paring. Before attempting to trim the nails, the points of the fingers should be steeped in water. Having been cut to a point level with the ends of the fingers, the nails will require filing only every morning to keep them the desired length and to make them strong. Putty powder is generally used to polish the nails, being accompanied by a vigorous rubbing with a chamois leather pad fixed on a handle. If necessary to whiten the nails, first cleanse them thoroughly with castile soap and then dip in a solution made as follows: Diluted sulphuric acid, two drams; tincture of myrrh, one dram, and four ounces of spring water, well mixed.

Whitlows and hangnails may be greatly benefited by frequent bathing in warm water. Soap poultices will be found very soothing and helpful, zinc ointment being used afterward to heal completely. The latter can be put on at night under the sleeping gloves.

Hair on the hands can be destroyed by the use of a mixture of equal parts of zinc oxide, barium sulphide, and starch. This should be moistened with water, applied as a paste, dried, and then scraped off. This preparation should not be used oftener than once in three days. The hair comes off readily with the dried paste. There is a somewhat disagreeable odor, owing to the presence of the barium sulphide, but warm water only is necessary to drive the odor from the skin.

Felons are often a source of great annoyance and should be taken in hand very promptly. When the felon first appears, cut off the end of a lemon and thrust the finger into it; keeping it there as long as possible.

CARE OF THE FEET

Something approaching to the care bestowed upon the feet in ancient times is noticeable among society people to-day. Pedicure establishments have increased rapidly, and ladies of means visit them as regularly as they do the manicures. With the use of the sandal we should doubtless attain again to that general beauty and symmetry of the foot common in Greece during the classical age.

Bathing the feet is, of course, as necessary as bathing the hands and face. The same care should be used about the acces-

sories; on no occasion allowing a common alkali soap to enter the foot bath. The skin on the feet is more delicate than that of the hands and needs proportionately more tender care, as it callouses much more readily. A little ammonia in the foot-bath is desirable, and palm-oil soap is strongly recommended. The ointment prescribed for the hands may be used with equal benefit on the feet, and the same attention should be paid to the nails as to those on the former.

Tender feet are the cause of much discomfort, and so long as people persist in not going barefoot or not wearing sandals this will probably be so.

A good powder for softening the feet, and at the same time rendering the flesh firm, is composed of French chalk and alum, equal parts, which has the additional virtue of removing the odor due to perspiration.

For the latter purpose, and where the offensiveness is very pronounced, the powder made as follows may be used by dusting it on the feet each morning:

Three ounces boracic acid, four ounces oxide of zinc, three ounces salicylic acid, and ten grains carbolic acid.

Abrasions of the feet or hands may be healed with the following salve, which is also good for chilblains and chapped parts: Boric acid, 2 parts; vaseline, 30 parts; glycerine, 3 parts. Perfume as desired. Other remedies for tender feet are to bathe them in tepid water with a handful of bran added, also a small quantity of borax.

Unpleasantness arising from over-perspiration may also be remedied by thoroughly washing each night and morning and cleansing with soap. When thoroughly clean place them in fresh water to which a teaspoonful of chloride of lime or two teaspoonfuls of salts of ammonia have been added.

Ingrowing nails are generally met with more frequently on the feet than on the hands. The easiest way to relieve is by filing the centre of the nail slightly, and by carefully cutting the troublesome end.

Corns are another of the nuisances of civilization.

They are treated in a great many different ways. Burning them out with lunar caustic or nitrate of silver is a method commonly employed. A fresh piece of lemon tied on to the corn daily is said to so eat into its roots that in a short time the corn will come out. Another method is to place the feet for half an hour, two or three nights in succession, in a strong solution of common soda. The alkali dissolves the corn, which ultimately drops out, leaving a cavity into which the natural flesh quickly grows.

Tincture of iodine or aromatic vinegar applied with a wooden toothpick to the corn each night will loosen it so that after a few days, when bathed in hot water, it will loosen and come out. To remove effectually, the remaining scales should be treated with the vinegar or tincture until the last vestige has disappeared.

Soft corns are even more troublesome than hard ones. Soap cerate spread on a small piece of rag and placed between the toes will usually give relief. The dressing must be continued daily. Ivy leaves are said to be very efficacious for the same purpose, and the aromatic vinegar or tincture of iodine will also kill the soft corn. Another corn cure is: Half an ounce of collodion, half a dram of borate of sodium, and half a scruple of extract of cannabis.

For bunions make a lotion of one dram each of glycerine, tincture of iodine, and carbolic acid.

CARE OF THE HAIR

A beautiful head of hair is justly regarded as a crowning adornment by woman. How seldom is this ornament, however, retained as long as might be possible in all its beauty! Even before middle age is reached most persons have seen with regret the premature decay and loss of their hair, due, unfortunately, in nine cases out of ten, to ignorance of the manner of treatment necessary to preserve it.

The proper care of the hair rightly commences with its growth in infancy, because, if due attention be given it then, many of the diseases which prey upon the scalp and undermine the follicle will be given no opportunity to gain a footing. The indiscriminate use of oils and pomades on the child's head is always to be condemned. They only serve to block up the pores and interfere with the growth of the hair. The brushes and combs used on young heads should be soft and free from roughness, and when the hair is tangled a few minutes' bathing in warm water, to which spirits of ammonia has been added, will quickly straighten it out.

In the early stages of its development the hair needs great attention, and the scalp should be bathed almost daily with an infusion of Murillo bark. It should always

be most thoroughly dried after cleansing. After this a gentle but firm brushing will be necessary. The brushing should always be in the direction of the hair growth, and never be done roughly. The oily matter in the hair will not then be forced out too quickly, and there will be no need for artificial oils or greases. When this secretion, however, is insufficient to render the hair flexible, soft, and glossy, the following formula should be used: Four ounces of cologne water, one ounce glycerine, one-eighth ounce of ammonia water, thirty drops oil of origanum. Clip the ends of the hair every two or three weeks.

A shampoo should be given every two weeks when the child is advanced a little more in years. It may be made of two quarts of warm water with a half dram of borax and two drams of water of ammonia added. Tight braiding of the hair is very detrimental to it, and will result in ultimate loss of strength and glossiness.

In all cases it is best to avoid using the public hairdresser, either for children or adults. Nine-tenths of the bald heads are caused by scalp diseases, the seeds of which are sown broadcast by the hairdressers' brushes, which are transferred indiscriminately from head to head. When the brush is formed of hard bristles, a slight puncture is easily made in the scalp, and then the parasitical germs are dropped in to take root and bear abundant fruit for decay.

Constant brushing will do more to improve the condition and appearance of the hair than any wash ever invented. The morning is the best time for this to be done, as the hair is then more supple. Not more than twenty minutes should be occupied in the process, and the brushing should not extend beyond the hair. The scalp *should be washed only,* and at least once a week. White soap dissolved in spirits of wine should be used in this operation, the head afterward being rinsed in tepid water. To prevent bleaching of the hair from too much washing, it may subsequently be rinsed in water to which two teaspoonfuls of common salt have been added. Careful dressers frequently use a sponge for the hair when rinsing it, and invariably dry it carefully with a cloth after each operation.

The number of diseases to which the scalp is subject, and all of which have a serious result on the hair, is legion.

Dandruff is one of the most common causes of the loss of hair. There are many remedies advocated for its cure, but none seems to be so efficacious as common flowers of sulphur dissolved in water, with which the head should be saturated night and morning. The advantage of this remedy seems to be that it does not impair the hair as certain other compounds do. Castor oil and alcohol or carbonate of potash and borax have both been considered specifics for dandruff.

A remedy for falling hair when not traceable to any direct cause is to soak the scalp before going to bed with one part of crude white birch oil and five parts of alcohol. The treatment must sometimes be continued for a couple of months, during which time the hair should be kept cut short and the head left uncovered as much as possible.

Another method is to shampoo the scalp with green soap and tepid water several times a week, after which a lotion should be well rubbed in, which is composed as follows: Four ounces bay rum, half ounce glycerine, two drams spirit of rosemary, and one dram tincture of cantharides. Another hair grower is made of: Cologne water, three ounces; glycerine, one ounce; tincture of cantharides, one ounce; camphor water, three ounces; rosemary oil, one dram. Apply morning and night. Also four ounces of boxwood shavings steeped in eight ounces of proof spirit at a temperature of sixty degrees for twelve days. Strain and add half an ounce each of rosemary and spirits of nutmeg.

Loss of hair may often be traced to scurf in the scalp. For this take a quarter pint of lemon juice, dissolve therein two drams of salt of tartar, and add fifteen drops each of tincture of cantharides and spirits of camphor. Keep this tightly corked.

The whites of eggs beaten up thoroughly and applied to the scalp will render the hair rich and glossy if the hair is afterward cleansed with bay rum.

Clipping the ends of the hair occasionally, and always when it is broken, will be found conducive to its development. The brushes and combs should always be kept clean.

An excellent plan for keeping black hair from turning gray is to take small doses of iron periodically. It is said that this prevents the hair from ever losing its original color.

Another method of preventing the hair from turning gray or restoring it to its pristine color is to take half a tumblerful of strong tea and apply it to the hair with maiden-hair fern, as if the latter were a

sponge. A little licorice may be advantageously added to the tea. The tea and fern combined are certain restorers of the coloring matter. The roots of the hair should be thoroughly rubbed every day for two months with this decoction, when the good results will begin to be visible, if not sooner.

Black hair can be readily changed to a golden hue by the use of peroxide of hydrogen. The hue changes gradually, passing through the various shades of brown until the golden tint is reached. Red or auburn hair can be produced by the use of henna.

An infallible method of coloring the hair either black or brown can be found in the following formula: Two ounces of tincture of sesqui-chloride of iron, two ounces of acetic acid, and five grains of acid of gall. Add the acetic acid to the others after the gall has been dissolved in tincture of iron, and apply after thoroughly washing the head.

To apply this dip the points of a fine tooth comb into the fluid and draw the comb slowly through the hair, from the roots downward, until the hair is thoroughly saturated. If the dressing be applied while the hair is moist, the hair will change to black, but if not put on until thoroughly dry, it will assume a brown shade. It is safer, however, to use no color for the hair.

With reference to superfluous hair, an excellent specific has been given in the section on hands. The undesirable growth on the face has baffled physicians and dermatologists for years, and most modern works on this subject contain descriptions of more or less barbarous methods for removing it. Many recommend the use of the tweezers, entailing the removal of each hair individually. But the tweezer is not infallible, as a recurring growth generally shows. Plasters made of galbanum and pitch spread upon leather and laid upon the hair growth are also used. They are said to bring away the hair, and generally the roots, if laid on carefully, and allowed to remain for several minutes. They should be drawn off slowly.

The electrolytic needle is probably the most popular means of removing superfluous hairs. If used properly it undoubtedly destroys the individual hair follicle treated, but it is said that a weaker and thicker growth of hair appears on the same surface as the operations have covered.

Some authorities recommend the use of a compress made from the evaporated leaves and roots of celadine prepared in boiling water, which is applied to the face and allowed to remain on all night. Particular care should be exercised in the use of any depilatory, however, and it is always best to act only under the advice of a competent specialist.

For curling the hair take two ounces of borax, one dram of gum arabic, one quart of hot water, not boiling. When the ingredients are amalgamated, add three tablespoonfuls of strong spirits of camphor. Wet the hair with this wash at night and do it up in curling paper.

THE EYEBROWS AND EYELASHES

One of the best methods of strengthening and brightening the eyes is to indulge freely in the use of the cold water douche for them. This will render them bright and sparkling unless some serious defect exists. Plenty of sleep in a pure atmosphere, and as much as possible before midnight, will enhance their brightness. Care should be taken to avoid reflections of the sunlight from water, which often produces lasting trouble to the eyes. Sudden awakening in a glare of sunlight is as dangerous as to have the moonlight playing on one's eyes while asleep.

The glare of the ballroom and the effect of long periods spent under the study lamp are bound to impair the natural brilliance of the eyes.

As a soothing and restorative agent when the eyes are overtired, there is nothing to excel a gentle bathing with opodeldoc. Witch hazel is sometimes substituted for this, but is not so efficacious.

The following is recommended as an eyelash or eyebrow developer: Two ounces of vaseline, one ounce of glycerine, quarter ounce of cantharides, and ten drops each of rosemary and lavender water. The eyes must not be touched with this lotion.

The eyebrows can be dyed by any of the formulas given for the hair.

The custom of clipping the eyelashes is believed to be conducive to their beauty, as it has been followed in the Orient for ages with well-known results.

It should be borne in mind, however, that no part of the body will endure as little tampering with as the eyes. The use of ammonia in the water with which the face is bathed has caused many troubles that eye specialists have found themselves unable to cure. Nor has any woman a right to use

belladonna. Indeed, no lotion, dressing, or ointment of any kind should be used on the eyes except by prescription of a competent physician.

TREATMENT FOR SKIN DISEASES

It must be steadily borne in mind that many of the imperfections of the skin are due to derangements of the internal organs, and will entirely disappear when proper medical attention has been given to such diseases.

There are other conditions under which the skin affection may be partially due to such internal troubles; while there are yet others which are entirely of a local nature, and where medicine would naturally be superfluous.

Eczema, many forms of pimples, sallowness, paleness, redness of the face, boils, and many less common forms of skin disorder, frequently come from dyspepsia.

In these cases the dyspepsia must be cured before any permanent results can be received from external treatment.

Biliousness causes many of the same outward symptoms.

Many more skin affections are the direct result of liver and kidney troubles, while yet others are due to an impoverished condition of the blood.

Sometimes in females they are due to conditions peculiar to certain ages of women.

A disordered liver is apt to be responsible for yellow and muddy skin, one particular form of which is chloasma or liver spot, which is a very great disfigurement to the face, especially in the case of a blond complexion. It is caused by an irregular distribution of the coloring matter in the skin. Blotchy faces are very often due, especially in the case of middle-aged persons, to liver disorder.

Defective action of the kidneys will frequently produce roughness of the skin, pallor, and blackheads.

Acne, on the other hand, is often the result of impoverished blood, due either to non-assimilation of healthy food, or too rapid growth or overwork.

Again, certain forms of pimples, more especially the white ones, flesh-worms, blackheads, freckles, tan, and even boils, may be due to no internal disturbance whatever.

If the soreness be due to lack of action of the sebaceous glands, or to oversusceptibility of the cuticle, it may develop into permanent disfigurement from exposure to sun, wind, dust, or bacterial germs.

There are many simple remedies which can be used when the correct diagnosis has been made of a case. To do this usually calls for the interference of a physician.

A good general rule, however, is to keep the bowels well open, that being the first essential to health and beauty, and the blood as pure as possible.

The household scrap-book generally contains a good many of these simple remedies, but so many new substances are being continually added to the materia medica that a first-class physician should be consulted when practicable, for obvious reasons. The same local conditions in persons of different habits and temperament would vary the efficacy of any general treatment prescribed.

Many persons are cured of constipation, after having exhausted the skill of the best physicians, by simply drinking a glass of hot water in the morning upon arising. Others have found the same results from taking the hot water before retiring.

In the latter case, relief from insomnia has often been experienced from drinking the hot water, sometimes accompanied by a warm foot bath.

Many modern physicians, however, prescribe the drinking of cold water.

A good laxative for temporary constipation is fluid extract of cascara sagrada, twenty or thirty drops of which can be taken in water, morning and evening.

The constipation may be, and generally is, accompanied by biliousness, in which case a lemon squeezed into the water without sugar added will prove beneficial, gently warding off the nausea until the fecal matter has been dissolved by the hot fluid, and peristaltic action has set in.

Fulness after eating, and flushing of the face, are due to indigestion, which may be caused by improper diet or weakness of the organs acting upon the digestive tract.

For this trouble, in its immediate shape, pepsin is usually prescribed, and it may be taken to advantage, sometimes with the following admixture: Powdered pepsin, 140 grains; pancreatin, 124 grains; dried papaw juice, 15 grains; concentrated lactic acid, 15 minims; weak hydrochloric acid, 15 minims; sugar of milk, 14 drams. Divide into twenty doses.

The minor liver troubles, due to insufficient action of that organ, are known frequently as biliousness. The delayed bile in the stomach enters into the blood and results in making it impure. This condition

produces blotches and pimply spots on the skin, or yellowness.

In this case, the cup of hot water in the morning should also contain half a teaspoonful of phosphate of soda.

When the condition is serious the diet must be at once arranged to meet the capacity of the liver until it has been restored to healthy action. Greasy foods, salt meats, tinned or shell fish, and very sour foods, must be avoided, as they either clog or irritate the organ. Cereals, fruit, eggs, underdone (or rare) meats, broiled fresh fish, vegetables, and coffee or tea, in moderation, should be taken, without beer or other stimulants.

Medicine will also be needed, and the following prescription might afford considerable assistance: Compound extract of colocynth, 12 centigrams; blue mass, 12 centigrams; extract of belladonna, 15 milligrams; aloin, 7 milligrams; sulphate of strychnine, 1 milligram. This should be taken for several nights in succession, in the form of pills, and every second or third night a five-grain blue pill must be also taken. At the time the medicine is used, there should be no attempt to use any local treatment other than keeping the pores of the skin well open by steaming or friction.

The medical treatment may be continued every two or three weeks, and local remedies applied as prescribed elsewhere for the particular form of skin trouble indicated.

In the treatment of boils springing from less serious trouble of the stomach and blood, a good dose of Rochelle salts should be taken every morning and a one-fifth grain pill of sulphide of calcium every five hours.

Boils are seldom cut or poulticed nowadays. Boric acid, in alcohol, is used for a dressing. It can be applied with a camel's-hair brush.

In cases of acne, which are generally the result of poor blood, a more liberal diet is prescribed and good meats with nutritious foods advised. Milk, claret, and sometimes porter, are advocated to add strength to the system.

If the appetite is poor a good appetizer may be found, early in the morning, in a cup of strong beef tea. Sometimes a raw egg in vinegar, with salt and pepper added, will prove efficacious, or a fruit juice or juice of lemon may be substituted for the vinegar.

Iron should be taken, in some form, to change the chemical constituents of the blood, and the following old-time prescription makes an excellent tonic: one-half pint of spirits frumenti; three-fourths oz. tinct. cardamom comp.; one and one-half drams tinct. nux vomica, one-half dram each pulv. gentian, pulv. columbo, pulv. quassia, cinchona, red, carb. iron. One tablespoonful is a dose, and should be taken before meals.

Temporary irritations of the skin, such as itchiness, nettle rash, or hives, can be best overcome by strict attention to diet. They usually result from overheating of the blood by indiscreet feeding or drinking, or else an injudicious mixture, which causes annoyance to the intestines. Certain articles, such as shell-fish, cucumbers, or berries, when first in season, will occasion these troubles continually with some individuals. In other cases the effect will be only experienced once, when the blood is in a condition to be easily irritated. Seidlitz powders, lemonade, sprudel salts, or some mild laxative can be used to cool the blood and relieve the stomach. When the irritation of the skin is intolerable, ease locally by applying carbonate of soda in warm water to the skin, letting it dry in and afterward dusting with talcum powder. A simple diet of cooked vegetables or white bread and milk is often resorted to in severe cases of hives, to afford a speedy cure.

With plenty of sleep, freedom from annoyance or worry, moderate exercise, healthy air, and plenty of mental occupation, such as interesting reading or quiet diversions, added to this regimen, very serious annoyances may be combated and removed.

The essential point to remember is the relationship existing between health and beauty, both of which require care and vigilance to preserve them at their best.

DEVELOPMENT OF THE FIGURE

"Were I a woman," said a certain sculptor, "I would prefer at any time to have an exquisite form rather than a beautiful face."

The nearest to the ideal form that we know of as a universal model is that of the Venus of Cnidus, executed in white marble by Praxiteles, which has been repeatedly praised and described by artists and art critics. It should be some satisfaction to the modern woman that this work of Praxiteles, like many other masterpieces of sculpture, was idealized, for in no one woman yet has been found all the charms combined in the famous statue. The best that can be expected is to possess a fair share

of them. In this age of corsets and other absurd fashions, the woman who can approximate to anything lovely in figure is a paragon. Better figures, in fact, are found among savage tribes than fall as a rule to the women of civilization.

Perhaps the trouble is largely due to the clothing worn. It is so easy to hide defects that women do not take pains to eradicate them, but simply cover them up.

The first question of vital importance in either developing or maintaining approximate perfection of figure is exercise. Nothing will take the place of the daily constitutional, not even the bicycle. In regard to other forms of exercise, the question has been already treated in these papers. Gymnastic exercises are among the most valuable developers of a perfect figure. Where the taste or habits make such exercise distasteful, massage will be found a valuable substitute.

Such outdoor games as tennis also serve to strengthen and upbuild certain parts of the muscular system, while rowing is another excellent form of exercise to practice.

Many women suffer from a tendency to fleshiness, and watch with sad misgivings their gradually disappearing contours.

For these there is immediate refuge in exercise, while diet will materially aid them. The kind of exercise will necessarily have to be different and more rigorous than what has been customary, while the diet must be rigidly adhered to. The training to which athletes submit in order to bring their weight within prescribed limits proves conclusively that fleshiness can be counteracted by system without resorting to medicine. Nevertheless, certain kinds of mineral waters have been proven to be valuable as flesh reducers, and they are preferable to any other form of physic. Overindulgence in sleep is conducive to fatness, and an easy, pleasant life generally often brings with it a full habit as a necessary penalty.

The hard, active, tireless worker seldom suffers from obesity, unless some constitutional cause is at the root of the matter, thus proving it to be a disease.

The diet necessary is an avoidance of all starchy and saccharine foods, also alcoholic fluids and milk. Among the articles to be specially avoided are: Ale, cocoa, potatoes, beans, peas, oatmeal, succotash, soup, cheese, butter, pastry and confections, and strong condiments.

Those permissible are: Underdone meats in moderation, tea, coffee, light, sour wines, fowl, and lightly broiled meats, cabbage, lettuce, cucumber, spinach, pumpkin, apples, grapes, peaches, cherries, gooseberries, raspberries, strawberries, currants, plums, oranges and lemons, eggs, oysters, and clams.

Two cups of hot water should be taken night and morning. Oxygen being the enemy of fat or carbon, outdoor exercise is indispensable. It is best taken before breakfast, as it induces early rising, and the lungs are freer and capable of longer inhalations before food is put into the stomach. The best system to pursue can easily be decided by the patient, and can only result satisfactorily if these general rules be observed.

Angularity of form and feature is another form of departure from the desired medium. Although leanness or scragginess can not be so easily overcome as its antithesis, it can often be greatly ameliorated.

Women who lead lonely, sedentary lives, and bury their whole existence in household cares, are apt to grow scrawny and peaked-looking in the face. Unfortunately many have not the disposition to be cheerful and make the best of circumstances. That is the keynote to many a long life and nicely rounded contour.

Fretful, pining natures never go with a well-rounded bust and a rotund face. Let the angular-figured woman try to cultivate cheeriness and hopefulness, think less of the thousand and one annoyances which she has to bear, and devote a few hours a day (whether the work is done or not) to some kind of amusement or diversion that is a pleasure to her. Then reverse the diet from that quoted for her expanding sister and increase her hours of ease and rest as much as she possibly can. If she does not become a Venus of Cnidus in a short time, a marked improvement will be noticeable and life will begin to take on that charm which it should possess for all rational creatures.

Many women suffer from imperfect bust development due to various causes. Mechanical appliances for the purpose of obviating this are of no value, but electricity, massage, with good skin food and vocal culture, will work wonders for women who will persevere in developing that most conspicuous of the sex's charms.

The value of the Russian bath in cases of extreme development of adipose tissue may be mentioned. It is a helpful auxiliary to the exercise and dieting prescribed.

THE BEST COSMETICS AND HOW TO MAKE THEM

THERE are hosts of toilet preparations on the market. Some of them are excellent, while others are mere humbugs, and many of the latter are so dangerous that their continued use ensures ruin to the complexion. When cosmetics are needed it is imperative to know that such preparations are harmless and beneficial.

For the benefit of readers who may wish to make their own toilet compounds at home a chemist who has devoted much time to the manufacture of this line of commodities has prepared a number of formulas for COLLIER'S CYCLOPEDIA. All the mixtures described below are absolutely safe for the purposes for which they are recommended, and will bring about the most desirable results.

The use of these formulas will be found money-saving; they will be found to come under the head of *profitable knowledge,* as well, for women who have the time and sufficient enterprise to make up the goods for sale.

Very little apparatus is needed. A small glass mortar and pestle, a small scale and weights from five grains to a dram, a four-inch glass funnel and some filter paper, and a two-ounce graduate marked off in drams are all that will be needed. It is necessary at the outset to learn the values of all the weights that go with the scale, and to remember that there are sixty grains in a dram, eight drams in an ounce, and sixteen ounces in a pound. When using the graduate, remember that there are sixty drops in a dram, eight drams in an ounce, and so on. With the filter there is a very simple little knack of folding the paper so that it will fit exactly into the funnel. Any druggist will show you, in a few moments, how to do this.

Now let us suppose that we are all ready to begin with the preparation of the first toilet requisite, which will naturally be a

COMPLEXION LOTION

For this you will need just one-half an ounce of quince-seed. Put this in a clean agate pan, pour over the seed exactly two quarts of boiling water. Set the pan on the back of the stove, where the seed can steep without boiling. Let stand thus, covered, for two hours, lifting the lid occasionally to stir a little. This can be done in the intervals of household duties. At the end of two hours take the pot from the stove, straining through cloth the quince-seed mucilage that will have resulted. As soon as the mucilage is cool, mix in the following proportions:

Quince-seed mucilage	Six ounces
Glycerine	One ounce
Rose water	One ounce

Fluid ounces are intended in each case above. Shake the mixture well and it is ready for use. If preferred, one-half ounce of tincture of benzoin (the making of which is described further along) may be substituted for rose water. The mucilage will not keep alone for many days, and should therefore be mixed with the other ingredients at once. This lotion will be found excellent for either the face or the hands, as a preventive of chapping, roughening, or sunburn. A woman who has much housework to do, and yet wishes to keep her hands smooth for sewing and embroidery, will find the preparation a boon.

THE BEST COLD CREAM

is made by melting together over a slow fire the first three of the following ingredients:

Albolene (solid)	Ten ounces
Oil of sweet almonds	One ounce
Japanese wax (very white)	One ounce
Otto of rose	Six drops

Albolene comes in two forms, liquid and solid, but the latter must be used, as the former would not make a cold cream. As soon as the first three ingredients have been reduced to a common molten consistency remove from the fire and begin to stir slowly and thoroughly. Herein lies the art of making a good cold cream. If the stirring is not thorough up to the time when the cream solidifies it will not be a good article. Just at the point where the mixture passes from a liquid to a solid add the otto of rose, or a few drops of any other perfume that may be preferred, though the cream will answer every cosmetic purpose just as well without any scent.

MILK OF BENZOIN

is a most excellent and very simple lotion. It is made by mixing, with shaking,

Tincture of benzoin	One ounce
Soft water	Seven ounces

This may be applied as a lotion as freely as is desired, with, of course, the proviso that should be insisted upon in the use of all lotions—that the skin be first thoroughly cleansed with warm or tepid water. Should the reader prefer to make her own tincture of benzoin, it may be done by grinding gum of benzoin in the mortar until it has been reduced to small pieces, these bits being then transferred to a bottle and four ounces of alcohol added. Set the bottle aside for a week, shaking several times daily. At the end of that time filter the liquid from the bottle through filter paper and the clear liquid is tincture of benzoin.

TOOTH POWDER

is one of the preparations for the toilet on which users have always disagreed, and they are very likely to continue to do so. Yet the subject is a very simple one. The requirements of a tooth powder are that it should gently scrape the tartar from the teeth and at the same time thoroughly cleanse them of other impurities. Such a tooth powder should cost about twenty-five cents a pound, and may be prepared as easily at home as elsewhere.

Precipitated chalk.....Four ounces
Powdered castile soap.....One ounce
Oil of wintergreen.....Twenty drops

Put the powdered soap and chalk in a bowl and stir thoroughly. After a while add the oil of wintergreen, letting a drop fall here and a drop there. Stir the oil thoroughly in, to ensure even admixture. This done, it is better to pass the powder several times through a patent flour sifter to give still better compounding. The powder is now ready to put away in a jar or wide-mouthed bottle. In buying the ingredients be careful to insist upon *precipitated* chalk; do not take any other kind. Do not attempt to powder the castile soap for yourself; it should not cost more than fifty-five cents per pound, while the right price for precipitated chalk may be anywhere between seven and fifteen cents, according to the quantity that is bought.

The above gives a mild dentifrice, suitable to the softest teeth. Should it be desired to *occasionally* use a powder that is more rapidly cleansing in its effect, take five ounces of the above powder and add to this quantity one ounce of *finely bolted* pumice-stone, taking pains to mix thoroughly. This pumice-stone preparation, however, should not be used above twice in the week, as a more frequent use would tend to injure the enamel of the teeth.

The above is the formula of the tooth powder that is probably the most widely sold in this country. All other innocent tooth powders are made along the same lines. Tooth paste has no advantage over the powder form, as the former consists merely of the addition of a little glycerine, water, and coloring matter. For those who wish a liquid dentifrice, without the chalk, we offer another excellent preparation that has been made famous through advertising, viz.:

Powdered castile soap....Three ounces
Glycerine .....Five ounces
Alcohol .....Thirty ounces
Water .....Twenty ounces
Oil of bergamot.....Two and a half drams
Oil of wintergreen.....Two and a half drams
Oil of clove.....One dram

In a bowl holding at least three quarts pour the glycerine, and to this add the powdered soap, taking care that no dust from the latter rises to the nostrils. Stir these two ingredients with a spoon, or rub them with a glass pestle to a paste. When the paste is complete, set aside. Next pour the alcohol into a bottle, and add the flavoring oils, one after the other, with much shaking to cut the oils. Next add the water, a little at a time, with much shaking. When the liquid mixture is complete, pour it into the bowl, stirring the paste into the liquid until the one is thoroughly dissolved into the other. Should you desire to color this liquid, make up, separately, the following

CARMINE LIQUID

Carmine, powdered.....Fifteen grains
Household ammonia.....Three ounces

Shake until the carmine is thoroughly dissolved in the ammonia. Now, having your liquid dentifrice ready in a large bottle, pour a very few drops of the carmine solution into the dentifrice. Shake thoroughly, and note whether the dentifrice is of the hue that you wish. If not, add two or three more drops of the carmine solution, and so on, shaking each time, until you reach the desired color, anywhere between a faint pink and a deep red.

To use this liquid dentifrice, thoroughly wet the brush with cold or tepid water and pour on a few drops of the liquid.

CREAM OF HONEY AND ALMONDS

This is an excellent lotion, and much liked by thousands of women in this country, although in most cases of poor complexion it is probably less effective than the first lotion offered in this chapter.

Nevertheless, for the benefit of those who prefer the honey and almond compound we give it herewith.

Take one ounce of sweet almond kernels from which the brown outer skins have been removed after soaking in hot water. Place the white kernels in a mortar, pour on a little water, and, with the pestle, grind to a paste, adding water gradually, until a half-pint of water in all has been poured in. Continue grinding until as thick and milky an emulsion has been made as is possible. When this is completed, strain the liquid through cheesecloth. To this add a fluid ounce of clear-strained honey, shaking until the fluid is completely mixed. This lotion will require a little shaking every time before it is applied to the surface of the skin.

CURE FOR FRECKLES

It must not be understood that, by this caption, any royal road to the banishment of freckles is promised. The cure, in order to be healthful to the skin, must be slow.

Powdered borax.....Fifteen grains
Lemon juice.....One ounce

Shake until dissolved. Apply three times a day on soft cloth, rubbing well into the cuticle. Avoid the heat of the sun as much as possible, as tanning retards the cure. If the victim of freckles is not too easily discouraged the obnoxious blotches will disappear after a few weeks.

Synthetic lemon juice may be used in the above formula in place of the real lemon juice.

TRICOPHEROUS

No better preparation than this for the hair can be suggested. Tricopherous, if a few drops be rubbed into the roots of the hair three or four times a day, will prevent the falling out of the hair, will usually remedy all but complete baldness, and will do much to restore the fibres to their original hue. Instantaneous cure, however, must not be looked for.

Add six drams of tincture of cantharides to twelve ounces of castor oil; shake well. Add three drams of oil of bergamot, and shake again. Next add twelve ounces of castor oil, with more shaking, until the mixture is complete. The tricopherous is now ready for use, although if the pink tint in which it is usually sold in the stores is desired, this may be secured by first heating the castor oil with two drams of alkanet root. After the oil has been colored, strain from the root.

SALICYLIC WASH FOR DANDRUFF

Salicylic acid.....Twenty-five grains
Glycerine .....One fluid dram
Alcohol .....Two ounces
Oil of lavender.....Twenty drops

Dissolve the oil of lavender in the alcohol, add the glycerine with shaking, and lastly add the salicylic acid, shaking until dissolved. When using, first wash the scalp thoroughly with castile soap and warm water, and then dry the scalp. To six tablespoonfuls of water in a glass add two tablespoonfuls of the above preparation, stirring well, and apply thoroughly to the scalp with a soft sponge or bit of canton flannel, afterward well drying the scalp.

WASH FOR SUNBURN

Powdered borax.....Three drams
Glycerine .....Three drams
Rose water (or soft water).....Six ounces

This mixture, applied two or three times daily, and gently but well rubbed into the skin, will render the cuticle beautifully soft and white, removing all tan and chaps, and preventing them.

THE NURSERY

ANY BOOK intended for general household use and information would be most incomplete without a few words, at least, on the things essential to the happiness and well-being of children. So important is this subject that many times the space of the present article should be allotted to it. However, the briefer and more concise our remarks, the better the chance of their being read and the greater the opportunity for being of service to those who need suggestions on this important subject.

Far too few people who undertake the joys and duties of parenthood realize the awful responsibility that they are assuming, and the imperative demands made upon them to live out the best that is in them—literally to devote their most vital thought to the interests of the little ones intrusted to their keeping. Not only does the child's physical nature require the closest and tenderest care and attention, to the ends of avoiding disease and securing proper development, but his mental and spiritual faculties are far more delicate and impressionable than most adults can imagine. The most trivial incident, apparently, will produce a lifelong effect on a young child, and in only too many instances such effects are not for the best. For this reason a child should be carefully shielded from all distressing and vicious influences, during the first years of his life; should, as far as possible, be kept in quiet and peaceful surroundings, and should be taught to depend upon simple things for his happiness.

Some people may not wholly understand the reasons for some of the statements just made, and may think that parents should be left to judge as to what is best for their own children. This is all very well; but parents should understand that the minds of children differ from those of adults principally in the perspectives of their mental vision. A child's brain has recorded very few impressions of the outer world, and none of his senses is properly adjusted to perceive things as his elders have found them to be. Consequently, many insignificant things look large to him; and they prove to be large too, in the effects they produce. In both painful and pleasurable experiences a child can safely endure only those of medium intensity. If he is to be too severely punished for some exasperating piece of mischief, the smart of that beating may last for many a year, and confirm in him the habit of sullen and morose humors. This should warn parents never to lose their tempers when chastising their children—never beat a child as a measure of revenge or exasperation. If, on the other hand, children are indulged; constantly provided with elegant toys, and allowed to think that happiness consists wholly in surroundings of this kind,

the inevitable result will be a selfish, discontented and extravagant spirit that is of advantage to none and a disfigurement to all who possess it.

Apart from the mental and spiritual environment of early childhood, which is never perfect, and must generally be what the worldly condition of the parents can afford, the physical well-being is of paramount importance. No amount of moral and mental training in after-life can compensate the ill effects of physical weaknesses resulting from early neglect and stupid mismanagement; and few early conditions are more productive of misery than those that result in confirmed ill-health and a weakened constitution. The following pages will be confined, therefore, to a discussion of this aspect of the matter.

HINTS ON THE CARE AND REARING OF CHILDREN

IT is a well-known fact that some of the greatest blessings we enjoy are the least appreciated, and this may be truly said of light. We are so accustomed to it that we fail to remember its importance, though did we but recollect that it is synonymous with life we could not fail to be sensible of the inestimable value of this essential of our being.

Deprived of its wholesome and enlivening stimulus, children become pale and sickly in appearance, the blood is imperfectly oxygenated, and a proneness to disease or debility arises.

A dark, dull room, or one from which light is more or less excluded, should by all means be avoided, for it is injurious alike to the eyes, health, and spirits of children. But necessary as light is (it is the natural food of the eye), it requires regulating according to the age. During early infancy the eyes should not be exposed to a concentrated or strong light; the sun's light should be softened by window blinds, and an infant ought never to be held too near an artificial light of any description.

The best arguments in favor of the beneficial effects of light are found in the facts that nearly the whole of the vegetable kingdom will cease to flourish if deprived of it, and that those children brought up in the dreary dark slums of cities, although quite as well fed as those of an agricultural laborer, are invariably puny, sickly creatures, without a vestige of color in their cheeks.

The pernicious custom which obtains so much among the lower middle classes in the suburbs of living almost entirely in the basement breakfast-room can not be too strongly condemned, where, as is invariably the case, it is dark. The room that is most in use should be "the best room," not on account of the amount of furniture it contains but owing to its being the lightest, and into this room the sun should be allowed to freely enter, all ideas of excluding it on account of the carpet being but false economy.

Notwithstanding, however, that a proper amount of light is necessary for a child when awake, equal care should be exercised in darkening the room when it (the child) is asleep, as too much light then will not merely prevent or interrupt sleep, but may act as a very injurious stimulus to the eyes and brain. It goes without saying that the nursery must, of course, have plenty of sunlight, and with this view should face the south, east, or west, but there is another place about which great care should be taken—the school-room. There is no doubt that the influence of a sunless school-room is most baneful to a young mind, and the want of interest in their study often displayed by children might in many instances be traced to this cause.

BATHING CHILDREN

Macbeth's maxim, "If it were done, when 'tis done, then 'twere well it were done quickly," is especially applicable to the bathing of children. There should be no nonsense about it. The object of bathing is not only for the purpose of cleanliness, but as a means of invigorating the capillary circulation, and so fortifying the system as to enable it to resist atmospheric vicissitudes.

To do this, however, it is imperative that the child should not remain in the bath (presuming it is not warm) more than a

minute or two, as when the body is immersed in water below ninety degrees there is a sensation of cold, a shrinking of the skin, and a rush of blood from the small capillary vessels of the surface to the internal vessels, which state of things should be speedily followed by a reaction by the heart and large vessels forcing the blood back again to the surface, and indeed to all the outlets; so that the skin glows and perhaps perspires, the secretory organs act more strongly, the liver and other organs show an increased activity, and there is a general feeling of liveliness and vigor.

But this will not be the case if there is and dawdling or delay, not only while in the water, but during the process of rubbing and drying, which must be performed with the greatest briskness in order that the proper reaction, upon which the virtue of the bath depends, should take place: otherwise the child will get a chill, which will, in addition to nullifying the good, do it absolute harm.

Temperature of the Bath.—Up to the age of three months infants should in all weathers be bathed in warm water, but after that age, at the warm seasons and during summer, cold may be used, provided the child be strong enough, and is not frightened, but if the experiment is attended with convulsive screaming and great distress, discontinue it and substitute a warmer temperature. In washing a very young child the head should always be the first part damped, and for that purpose a flannel is preferable to a sponge.

With regard to all children there are not two opinions on the subject of a daily bath given immediately on rising being beneficial, in fact it is a *sine quâ non* of perfect health, provided, of course, the child is not too delicate, and for the elder ones a large sponge is a necessity, as by its use a much larger quantity of oxygen can be introduced into the skin than by any other means.

The Use of Sea-Salt.—The addition of sea-salt is a most desirable adjunct, especially when the hips are weak, but even when in good health its occasional use will add greatly to the tonic properties of the bath. It should be added in such quantity to a bath that the mineral ingredient is equal to that contained in salt water; it will be far more efficacious than a simple fresh water bath, as it combines the advantages of temperature with the stimulating action of the salt upon the skin.

The advantages of such a bath taken at the time mentioned are twofold. It inures the body to a greater degree of cold than it is likely to be exposed to during the rest of the day, and so proves most serviceable in protecting it from atmospheric influences; and it tends to remove irregularities in the circulation, and, by exciting the healthy action of the skin, may aid that organ in removing disease.

All, however, are not strong enough to stand the shock to the system, and not only those who are extremely weak, or who have any organic disease, especially of the heart or lungs, but there may be some idiosyncrasy or condition of the constitution peculiar to the individual which would render it impossible. The invariable test is that if after a bath the child remains chilly, languid, and dejected, or suffers from headache, then it is not beneficial, but if the sense of cold rapidly passes off and a glow of warmth and animation of spirits succeeds and continues for some time, the cold bath can not fail to be productive of good.

SLEEP

Although much has been written, and rightly so, on the subject of laziness, there is as much, if not more, to be said on the necessity of enough sleep, for it is as great a necessity as eating and drinking.

Infants sleep almost continually, and (in this we know most mothers will heartily concur) they can not sleep too much, owing to the necessity for providing the materials for growth. When they are unable to sleep for any length of time their condition is unnatural, and shows us that they are suffering in some way or other, the cause of which should be ascertained and removed; but not by the use of syrups, elixirs, etc., which, though they produce slumber, do not produce sleep.

For young children from twelve to fourteen hours' sleep is necessary, and this must be regular, the proper time for bed during the winter months being about six o'clock, and in the summer months about seven.

A proper desire for sleep is only obtained by a due amount of exercise, both mental and physical, which must not have continued sufficiently long to produce prostration. Exercise in moderation is most necessary before going to bed, but anything of a violent nature, like romping, should be avoided for at least half an hour before.

With regard to the hour at which children and others should rise, that must be determined by the time of their waking, and in order to wake at a proper time all that is necessary is that you go to bed at some

regular early hour, and then, says an authority, "within a fortnight nature, with almost the regularity of the rising sun, will unloosen the bonds of sleep the moment enough repose has been secured for the wants of the system." To remain in bed after this, to indulge in that short morning doze into which so many allow themselves to fall because it is not, they think, quite time to get up, is a baneful practice.

Care should also be taken with regard to the quantity of bedclothes indulged in, too much clothing having the effect of relaxing the body, and it is right therefore to have only sufficient to enable the individual to sleep, for it is better to wake with an inclination to draw the clothes round you than to feel oppressed by their weight and heat and a desire to throw them off.

With regard to the proper position of a sleeper all are agreed that it should be on the right or left side, because if you sleep on your back, especially soon after a hearty meal, the weight of the digestive organs and that of the food, resting upon the great vein of the body, near the backbone, compresses it, and arrests the flow of the blood more or less. If the arrest is partial, the sleep is disturbed, and there are unpleasant dreams, a state of things carefully to be avoided when we remember that "the man who dreams does but half sleep. The child who dreams scarcely sleeps at all."

Too much attention can not be paid to the proper ventilation of sleeping-rooms. In too many cases this important subject is entirely neglected. The sleeper retires to rest in an apartment from which every effort has been made to exclude the outer air —until it seems almost hermetically sealed —and rises with a dull headache and a feverish, unrefreshed sensation to go about the duties of the day.

ON CATCHING COLD

It is a very common, but a very great, mistake to attach little importance to catching cold. How frequently we hear the remark in reference to some one being indisposed, "Oh, it's nothing; only a severe cold." Considering that in adults severe cold is the cause of one-half "the ills that flesh is heir to," it will readily be understood that colds with children are of the greatest consequence, for, in the language of one whose revered name is the synonym for nursing, "It is as easy to put out a sick baby's life as it is to put out the flame of a candle."

The most common kind of cold is that in the head, professionally described as *catarrh*, which consists of inflammation of the mucous membrane of the air passages, and is ordinarily caused by the child having been exposed to a draught, having got its clothes wet and not been able to have them changed, or by not being sufficiently warmly clad when the body is getting cool after being heated. The latter is the most to be feared, as in this condition the body is incapable, from exhaustion, of reaction, and the exposure intensifies the depression.

Wet clothing does not frequently produce "a cold" if the child is walking or running about, and is able to get the things changed when the active exercise ceases, and avoids all exposure for some little time; but where exertion has been indulged in, and the body is in a state of perspiration, then, if the child receives a chill from wet feet or any other cause, and does not continue its play or its active exercise, catarrh is almost inevitable.

When it is remembered that a neglected cold sometimes produces bronchitis, pneumonia, quinsy, rheumatism, erysipelas, toothache, neuralgia, inflammatory fever, consumption, etc., it is scarcely possible to impress upon mothers too strongly the great necessity for extreme care in this matter; and as prevention should be much more easy when the cause of a complaint is understood, we propose to try and explain in as simple language as possible the why and wherefore.

The action of cold is to partially close the pores of the skin, check the natural perspiration by constricting and obstructing the vessels of the skin, and so throw more blood inwardly, producing internal congestions; for the outer skin being incapable of performing its functions, and perspiration being an absolute necessity, the inner skin, or mucous membrane, has to do the work, and hence the inflammation.

The effect of cold is felt in a greater or less degree according to the capillary circulation. If this be weak, or be rendered so by excitement, exercise, or sleep, the danger is increased; consequently children —and any one else, for the matter of that— are most susceptible to cold when coming out of a hot room, after being unduly heated by running, or when sleeping.

From this it will be understood that the chilling influences enumerated derange the balance of the circulation, and by determining a corresponding amount of congestion inwardly, fix it in some part previously weakened and made susceptible to disease;

or, in still plainer language, the cold flies to the weakest part, which accounts for one person getting rheumatism, another congestion of the lungs, a third a sore throat, and a fourth, perhaps, merely a cold in the head or chest.

To CURE A COLD is to restore the action of the skin and induce perspiration, and this, if done at the proper time, when the symptoms are first observed, is exceedingly simple. People may sneer as they will at the mention of the word gruel, but a basin full of hot gruel, made thin, and taken when in bed, will invariably arrest an ordinary catarrh. If the chill be severe, the child's feet should be placed in warm water, a little extra clothing be placed on the bed, and the patient allowed to lie in bed a little longer than usual the next morning; but the apartment must not be too warm or close, or the additional clothing be too great, as, though the cure may be accelerated thereby, the susceptibility is increased, and the child rendered more liable to a recurrence of the attack.

To those who will not believe in anything old-fashioned or simple, the plan of a "wet sheet pack" will be found equally efficacious. This is managed by spreading three blankets on the bed and putting on the top a sheet, which has been saturated in hot water and wrung out. The child is then placed upon the sheet, enveloped in it, and the blankets wrapped tightly round the whole body excepting the head, and allowed to remain in this situation for about an hour, when a quick sponging of cold water should be given, followed by a brisk and thorough rubbing with dry towels.

Another remedy believed in by many of our medical brethren is the "dry" plan, which, at any rate, has the merit of simplicity, for it consists in merely abstaining form every kind of liquid until the disorder is gone.

Although opinions may differ, however, as to the precise method of cure, and any of those given will be found equally efficient, there is no difference of opinion as to the cause and prevention. The too frequent cause is simply the result of carelessness or imprudence in not protecting the body against the variation of temperature, an insufficient use of cold or warm water to the body, or, plainly, uncleanliness, sleeping under too much clothing, or by sleeping in badly ventilated rooms; but the first mentioned, the passing from a hot room out into the open air, or into a room where the temperature is less, without being suitably attired, is the most frequent and the most to be guarded against with children.

The prevention of cold is best achieved by diminishing the susceptibility of the system by abstemious living, taking regular and daily exercise in the open air, and a morning bath of cold water if the child be strong enough, and if not, a tepid one; but the best prevention and cure for colds is "the cold-water cure."

TEETHING

is one of the most distressing of the ordinary ailments of children, for it comes to them at an age when they are incapable of making the nature of their sufferings known, and as they do suffer most acutely sometimes during the process of dentition, it is very trying to mothers and nurses to have to witness their torture and be unable to alleviate it because the poor little mites can not explain their symptoms.

Being one of the very common ills that flesh is heir to, it is a time frequently regarded by some as more troublesome than important—a great mistake, to prevent which a simple statement showing the action of one of the phases of the disease may be advisable. The chief disorders of the first set of teeth are caries and inflammation in the periosteal membranes, terminating in abscess, or what is commonly called gumboil. The first effect of inflammation in the periosteum is to create pain, tenderness and swelling in that part of the gum in close proximity to the tooth, and an effusion of fluid between the fang and its investing membrane, which is thus converted into a sort of cyst or tiny sack of skin. Repeated attacks of inflammation at length end in the formation of pus, which either bursts through the tumor in the gum or may be removed by lancing. Sometimes after the abscess has burst or been opened, a fungus springs up from the diseased membrane lining the cavity. With some children the presence of the abscess having produced absorption of a portion of the alveolar process at its lower part, it effuses its contents through the aperture thus formed, and matter forces itself along the surface of the lower jaw, and forms an external tumor near its base.

With regard to the process of dentition in infants, the time at which teething takes place is naturally subject to slight variation, when it is stated that many medical men give instances in their experience of children being born with teeth, or having cut them almost immediately after birth—Louis

XIV of France and Richard III of England being historic cases in point; the usual time, however, when babies begin to be troubled with the advent of teeth is at the seventh month, the period of the first dentition lasting up to the age of two years or two and a half years.

The symptoms of teething in a healthy child are that, for some time before the gums are much swollen, there is an excessive flow of saliva from the mouth, and the child indulges in what is known to most as "slobbering," at the same time evincing a very strong desire to drag into its mouth anything upon which it can fix its tiny little clutch, while, if we place our finger in its mouth, we perceive at once a decided attempt to bite, which affords a relief to the irritation of the gums. Where the child is inconvenienced only to the extent described there is no remedy required, provided there is no constipation, but where this is the case small doses of castor oil are the safest. As to the article it should be given to suck, possibly the best is an ivory ring or a "finger" of crust of bread, great care being observed in the latter case that it is taken away before there is a possibility of its being broken or bitten off.

When the child is extremely restless, cross and uneasy, crying bitterly without any apparent cause, and refuses all ordinary attempts at pacification, its suffering is very considerable, which is increased by its ineffectual efforts to sleep for any length of time. The cheeks become flushed at this time, and if the local inflammation continue to increase the gums may ulcerate; in this case apply a little borax and honey to them, but where the irritation continues and the pain is obviously great it will be necessary to lance the gums, for which purpose, it is almost unnecessary to add, the services of a surgeon should be secured at once. At this time it is more than ever necessary to keep the bowels well open, a mild attack of diarrhœa being far more preferable under the existing circumstances than the reverse state of things.

All food requires to be carefully chewed in order that the various organs may perfectly perform their proper functions, and this can only be the case when the meat, or whatever it may be, is broken into minute portions and duly mixed with saliva, without which it will not be properly digested. The horrors and evils of indigestion are too well known to need commenting upon here, but the necessity for a due attention to the mastication of food by children will be seen when it is stated that a weak stomach acts tardily and imperfectly upon anything introduced into it not properly chewed; and the consequences are, the warmth and moisture of the stomach evolve gases, acids are formed, and then follow those distressing symptoms such as loss of appetite, flatulence, furred tongue, etc.

The period of "teething" is more than interesting, from the fact that, at this stage of child-life, the whole organization seems to undergo a transition. The features, hitherto more or less expressionless, become decided and distinct; the eye becomes endued with expression, through which the mind seems to speak, as it were; the round appearance of the facial outline appears elongated, the result of the teeth expanding the jaws; the forehead is perceptibly developed, and, in short, the entire face assumes an animation previously unknown, but most precious to mothers, on account of its being the ordinary time when "baby is beginning to notice."

The order in which teeth usually make their appearance is, first, the two central incisors of the lower jaw; then shortly after those of the upper jaw, followed by the lower lateral incisors, and then by the upper lateral incisors. At the age of a year or fourteen months the four first molar teeth should begin to show, and at the sixteenth to the twentieth month the lower and upper canine teeth, followed by the four last molars.

Although the suffering of infants from the process of dentition arises mainly from irritation of the gums, owing to the teeth working their way through, it is not in the mouth alone that pain is caused; and where this is excessive, or in children whose constitutions are naturally irritable, the irritation is reflected by the nervous system to some other organ or system of organs.

The most ordinary effect of this is stomach-ache, or diarrhœa, with gripings, which, if in a mild form, is the least to be feared of all the unpleasantness arising from teething; and though its violence may be moderated, it should not be entirely arrested. Under these circumstances, a child soon gets weak and thin, and its flesh soft and flabby; but, generally speaking, this need not (except, of course, in an extreme case) be viewed with alarm; for, as soon as the teeth are through, nature soon rights itself, and the little one will resume its wonted good looks. When, however, the symptoms are very distressing, by the quantity and frequency of the discharge, a chalk mix-

ture, with a drop or two of laudanum to the ounce, according to the age of the child, may be given, in the event of a medical man not being procurable. Where there is a great pain and flatulence, an occasional warm bath, and the use of liniment, composed of half a drachm of laudanum to two ounces of compound camphor liniment, or a mustard or linseed-meal poultice, composed of one-third of the former to two-thirds of the latter. When the foregoing symptoms are accompanied by vomiting, it is exceedingly troublesome, and, if the sickness is not relieved by the division of the gums, it should be checked by administering a half-drop or a drop of laudanum.

Besides the maladies mentioned that are the outcome of teething, there are many others, such as eruptions of the skin, spasm of the glottis, and affections of the nervous system generally, of too complicated a nature to treat in this article, as the remedies necessitated are as complex as the diseases; but there is one serious disorder connected with dentition unfortunately too common. We allude to convulsions, the treatment of which should be known to all.

Convulsions in their mild form consist of muscular twitchings of the face, accompanied by an obvious difficulty in breathing and a rolling of the eyes. When severe, the child becomes insensible, and the muscles of the head, neck, and extremities are convulsed in various directions. The eyes are insensible to light, and turned rigidly up to one side. The appearance and symptoms vary, of course, for, in addition to those named, with some children the face is congested, but sometimes pale, the lips livid, and there is frothing at the mouth. The hands are usually tightly clinched, and the thumbs turned inward, with the fingers on them, and in some cases the soles of the feet are turned together, with the great toe bent into the sole.

The treatment for convulsions is, as a rule, a warm bath, and, in the absence of a doctor, the best thing to be done is to immerse the child in warm water of about ninety degrees temperature for about ten minutes or a quarter of an hour, applying at the same time a cold, wet towel for two or three minutes to the little sufferer's head. Previous to the bath, which will take a few minutes at least to get ready, loosen all the clothing about the neck, chest, and body, raise the head, sprinkle the face with water, and admit plenty of fresh air.

With regard to the general treatment of children during teething, their heads should be kept cool and their feet warm, and, if the weather will admit, they should be bathed in cold water, especially about the head, and taken out daily in the open air. At night it is equally essential that their heads be kept cool, and therefore no caps or coverings should be used.

As before stated, diarrhœa during dentition, unless very severe, should not be stopped, but regarded as an effort of nature to relieve congestion in the head; and where the opposite effect is the case, purgatives should be avoided, and the bowels regulated by suitable diet; in obstinate cases by injections. Constipation in infants may be almost entirely attributed to defective diet, and if, while nursing, mothers and nurses would carefully avoid any article of food or drink of an indigestible or stimulating character, this ailment would be comparatively unknown.

WHOOPING-COUGH

This disease, almost absolutely confined to infants and children, is, luckily for them, more distressing in its symptoms than dangerous in its effects, a case of whooping-cough, *pur et simple*, being rarely fatal. Like croup, it is more common with very young children, the usual age when they are more subject to it being from two to ten years; but, unlike croup, it is more common to girls than to boys, and appears but once in a lifetime, though cases have been known where the cough continued daily at a certain hour for several months, and, after ceasing for some time, returned for two successive seasons.

The symptoms which usually precede this malady are those of ordinary influenza. First and foremost there is a languor, restlessness, feverishness, and unaccountable irritation, except that the little one is thought "to have caught a slight cold," then loss of appetite, sneezing, coughing, follows, with a running at the nose; this is in the case of an ordinary and not severe attack. Where the disease is in an aggravated form, the fever is more intense, the thirst greater, the pulse quicker, and the oppression and distress in proportion, the cough very frequent and painful, dry at first, but with excessive expectoration afterward. This may be called the first stage of the disease, and is the customary prelude to whooping, but it is perfectly possible to dispense with these preliminaries, and for a child to be suddenly seized with the too well-known cough. These symptoms ordinarily continue from ten days to a fortnight.

The second stage is marked by the dying-out of the symptoms of cold and the commencement of the fits of coughing, which are best described as a number of expirations made with such violence, and repeated in such quick succession, that the child seems almost in danger of suffocation. The face and neck are swollen and livid, the eyes protruded and full of tears; at length, one or two inspirations are made with similar violence, and by them the peculiar whooping sound is produced; a little rest probably follows, and is succeeded by another fit of coughing, and another whoop, until after a succession of these actions, the paroxysm is terminated by vomiting, or a discharge of mucus from the lungs, or perhaps both. The duration of this stage is usually from six weeks to a couple of months, but sometimes continues for a much longer period, the disease, in some cases, lasting from the beginning of winter until the end of spring.

The debilitating results of the disease depend to a great extent upon the violence and duration of the attack, and the strength or weakness of the constitution, but, as a rule, if there are no complications, these are of no great moment. The frequent vomiting decreases the appetite, and disturbs digestion, which interferes with nutrition, and the child naturally loses flesh, which is more or less flabby, and the skin is unusually dark, especially underneath the eyes.

The subsiding of the attack is marked by the fits of coughing becoming less frequent, though possibly they may be as fierce as ever, the paroxysms lasting from a minute to a quarter of an hour. In proportion to their violence and duration will be the child's breathlessness and fright and its efforts to respire. If in a recumbent position, it will suddenly jump up and seize hold of whatever or whoever is nearest, in order to be assisted in overcoming the spasm. When the fit is over, the child appears exhausted, and requires a short rest to recover itself; but then, and during the interval to the next cough, it is comparatively easy and cheerful, often playing about as usual, and not averse to food, except where the case is a severe one, when extreme languor supervenes.

The period at which these paroxysms recur varies considerably; during the early part of the attack they are very frequent—about every half-hour, and in some extremely severe cases as often as every ten minutes—the chief cause of their return being the accumulation of mucus. Consequently, if this be got rid of by the coughing, the fit will be light; but if it is expelled with difficulty the efforts will be greater, and the cough renewed almost immediately. These fits are produced by many things—a hearty meal, a fit of passion, crying, fright, or laughter, will either of them be sufficient to bring on an attack.

Although we have stated that this disease is rarely attended with fatal results, it must be distinctly understood that this statement applies to whooping-cough *per se;* it is perfectly correct, but for fear any one should not be sufficiently careful, it is a disorder which, if improperly treated, or if the case be one of an extremely acute character, may lead to something of a complicated and highly dangerous nature.

It is a complaint which lends itself a great deal more to careful nursing than to an elaborate course of medicine, for it will run its course, and requires guiding and watching more than checking, great care being necessary to note the symptoms, lest they assume a conspicuous or alarming character, and by appropriate treatment prevent the affection having those complications alluded to which constitute it a disease of danger. On the slightest appearance either of inflammatory affection of the lungs or of a tendency to convulsion, a medical man should be sent for immediately.

During the first stage an emetic of ipecacuanha, followed by an expectorant every four hours, should be given, the latter consisting of ipecacuanha wine, syrup of squills, a little syrup of white poppies and almond milk, and some mild aperient, such as castor oil or salts and senna, the emetic only to be repeated occasionally. The rooms to which the child ought to be confined should be of an equable temperature, about sixty-five degrees, the bedroom being ventilated during the day and the sitting-room during the night; but the windows of the apartment must on no account be opened while the patient is in them.

When the second stage arrives, while proper attention is paid to temperature, the cough will be found much slighter and the expectoration much less than if the child were permitted to be exposed to the external air, the emetic being continued occasionally, and also the mixture, with a few drops of laudanum added to it.

With regard to change of air, there is no doubt that, while the attack is unsubdued, no matter what the weather may be, the

patient should be confined not only to the house but to rooms, as already stated, but when the disease is on the wane, the change from a cold situation to one of warm temperature is most beneficial in accelerating a return to convalescence, though the greatest caution is needed in this matter.

The diet of the child during the entire illness is a most important feature in connection with the treatment, and should consist chiefly of milk and farinaceous foods, meat being of too heating a nature, unless the child is very weak and low, in which case tolerably good broth will be the best mode of giving animal food.

VACCINATION

Unfortunately that dangerous and much dreaded malady — smallpox — is prevalent, and it would be well for parents and others to be reminded of the necessity of revaccination every five years.

It is astonishing that, though this discovery is undoubtedly one of the very greatest blessings to poor humanity, it should now be thought so little of, and that there should be some who actually decry and refuse to accept it as such, when there is no doubt that if every one had followed the instructions as to revaccination, by this time smallpox would have ceased altogether.

No language can be too strong to depict the horrors of this disease, or to denounce the culpable ignorance of those who, blinding themselves to the blessings of vaccination, set the law at defiance and thus endanger the lives of their fellow-creatures. Supposing it could be proved that in some cases vaccination has been the means of imparting disease, the overwhelming number of cases where it has not, but has been a preventive of this terrible malady, ought to show its necessity on the beneficent principle of studying the greatest happiness of the greatest number.

To children smallpox has ever been distressingly fatal, and, though it is impossible to give any course of treatment for its cure in an article of this character, as so much depends upon the violence of the case, the state of the patient's constitution, and the stage of the complaint, it may be said that the old practice of close, hot rooms, warm clothing, and hot drinks is a proved mistake, cool, well-ventilated apartments, comfortably cool bedclothes and cooling drinks having been found to be not only more pleasant but more successful in their results. When the disease first makes its appearance, if the fever be moderate and no professional advice be procurable, the patient should be confined to bed, and cool drinks and a dose or two of purgative medicine administered.

FEVERS AND THEIR TREATMENT

Measles.—An acute specific disease—febrile and infectious, ushered in with catarrhal symptoms and characterized by an eruption on the skin, which appears usually on the fourth day.

Usual Symptoms.—After a period of incubation varying from twelve to fourteen days (the period of incubation in cases produced by inoculation is seven days), there is manifested alternate chilliness and heat, a quickened pulse, aching in the limbs, slight headache, soon followed by redness of the eyes, coryza, huskiness, and hoarse cough. On the fourth day there is an eruption of soft, circular, very slightly elevated dusky red spots, which appear first on the forehead, and extend over the face, neck, and whole body. The spots gradually coalesce and present a peculiar crescentic or horseshoe shape. The spots disappear on pressure. They attain their greatest intensity on the fourth day from their invasion, and by the seventh day they fade away with a slight desquamation of the cuticle. As a rule, the fever does not abate on the appearance of the eruption.

Occasional Symptoms.—There may be no prodromata whatever, or the attack may be ushered in with convulsions (especially in children), or there may be delirium, or there may be a great amount of fever, or there may be and often is sore throat; more rarely severe headache, and sometimes absence of the coryza.

The eruption may be scanty, or most abundant and confluent, but the quantity of the eruption *per se* does not affect the gravity of the attack; the color of the eruption may be dark, constituting so-called "black measles"; there may be petechiæ, which do not fade on pressure and resemble purpura; these do not *per se* affect the prognosis. Miliary vesicles are often present, and when abundant the amount of desquamation will be greater.

Prognosis.—If uncomplicated, favorable. Unfavorable signs are great fever, great dyspnœa, sudden vanishing of the rash, together with an access of delirium; brown, dry tongue, with special severity of some two or three symptoms; petechiæ, with a typhoid form of fever. Capillary bronchitis

and pneumonia are the most frequent proximate causes of death.

TREATMENT.—The child must be kept in bed in a large, well ventilated room, free from draughts—a point of vital importance, looking to the frequency and danger of chest complications. The diet must be low. Tepid drinks may be freely given. It is very important in measles, as in all infectious fevers, to remove all discharge and soiled linen instantly; the motions should be passed into vessels containing chloride of lime, carbolic acid, or Condy's fluid; this with ventilation will go far to prevent infection. There is no objection, if it be grateful to the patient, to have the body gently sponged with warm water; and if itching be much complained of, inunction with unsalted lard is useful. Cough is often the first troublesome symptom which requires special treatment. If the fever should run high, the weak mineral acids sweetened and largely diluted will be very grateful. Or a mixture of citrate of potash and Rochelle salt may be given in an effervescing form. If the fever be of low type, with brown tongue and failing powers, large doses of chlorate of potash will be useful, and stimulants will be required. Yelk of egg beaten up with wine is excellent in such cases. Purgatives, as a rule, are not required; if employed they should be mere laxatives, remembering the diarrhœa which usually sets in toward the close of the disease. In cases attended with much nervous excitability and convulsions or delirium, bromide of potassium in full doses will be useful. This drug will also procure sleep, and is better for the purpose than any opiate. Sudden recession of the rash, attended with an onset of delirium, should be met by plunging the child into a bath containing mustard, and leaving it in until the surface becomes red, which usually occurs in a few minutes. The child should then be rolled in a blanket, and the strength supported by nutritious diet, and stimulants as needed. For laryngitis, a sponge wrung out of very hot water should be applied over the larynx, and inhalation of steam encouraged. Pneumonia will call for a stimulating embrocation over its site, and the administration of stimulants, expectorants — carbonate of ammonia with senega is the best.

Lung and all other complications occurring during the early stages are best treated by endeavoring, with external stimulants, *e.g.*, the mustard bath, and internal, gentle diaphoretics, to get the rash thrown out freely. Later on this is, of course, inadmissible, and the strength must be supported in every way.

THE SYMPTOMS OF SCARLATINA

Scarlatina is an acute specific disease—febrile, contagious, and infectious, and accompanied by a peculiar eruption of the skin. After a period of incubation, varying according to different authors at from four to forty days, and probably averaging from four to six days, there appears in children vomiting, in older persons sore throat, and the onset is usually sudden. It is common for adults to be able to fix the hour in which the sore throat began. In children, severe vomiting often prognosticates severe throat affection. Next there is noticed fever, a frequent pulse, commonly 130—170, a flushed face, a high temperature (103 or 104 degrees F., even on the first day), hurried breathing, furred tongue, hot skin, and thirst. At the same time there is lassitude and restlessness, headache, and at night delirium. On the second day, usually about the root of the neck and upper part of the chest, appears the eruption, which is a scarlet efflorescence consisting of innumerable red spots at first separated by natural skin, but soon coalescing and producing a general redness; the skin is rendered pale by pressure, but the redness immediately returns—the rash is not elevated to the touch. It is most abundant about the hips and loins, and the flexures of the joints—in fact, where the papillæ of the skin are largest. The eruption reaches its maximum intensity on the third or fourth day; by the fifth it has begun to fade, and by the eighth it disappears. It goes off in an order corresponding with its invasion. Miliaria are often present, perhaps more commonly in adults than in children; they in no wise affect the prognosis. The sore throat is very important, especially in children. A child may die from throat disease without any complaint about its throat having been made. The throat should therefore always be carefully examined. The tonsils will usually be found enlarged and inflamed, and often coated with a thick white tenacious mucus.

CROUP AND ITS TREATMENT

This disease is characterized by difficulty of breathing; hoarseness; a ringing cough, which, when once heard, will be distinctly remembered; the cough is followed by a "*crowing* inspiration."

There is inflammatory fever; frequent and hard pulse; thirst.

The attack is most liable to come on in the night—either altogether unexpected, or preceded by a cold, sore throat, or catarrh.

TREATMENT.—Apply to the throat very cold, wet cloths well covered with dry. Keep the child in bed. Rub with the dry hand the back and limbs, and continue this until a hot bath is made ready; renewing the cold cloths to the throat every few moments. When the room is made very warm and the bath at hand, place the child in the hot water, as hot as can be borne, and rub the chest and abdomen and the whole body very briskly. Add more hot water, and keep the body (even to the neck) immersed.

Have a dry, hot sheet ready in which to wrap and rub dry the little patient. If fever is high, now put on the abdominal bandage wrung from warm water. Cover well with dry flannel—a small blanket or even a good-sized one is none too much. Apply again the cold, wet cloth to the throat. Keep the feet warm; and, if the breathing is not easier now, foment the throat and upper part of the chest for twenty minutes alternately with the cold compress.

Pat and rub the back and chest. Manipulate the arms and legs. Give drinks of hot water and of cold. Follow the symptoms with "all diligence." Do not relax effort until the breathing is liberated. If the bowels are not free, give full, warm enema.

If there is tendency to coldness of extremities, give hot foot bath occasionally; also apply dry flannels, heated very hot, to the throat, if they seem more agreeable than the hot fomentation.

Keep the patient in a warm, well-ventilated room. Give only baked apple, or toast water, or gruel as food, until the symptoms yield positively.

We have been told by physicians that it often occurs in their domestic practice with children, that, by the time the patient is rubbed with the dry hand, having the cold compress on the throat until the hot bath is made ready, there is no need of the bath; the breathing is relieved. But it is not always so, as cases of what is called "membranous croup" have lasted persistently for days. It is a dreaded disease, and justly so.

MUMPS (PAROTITIS) AND ITS TREATMENT

This disease often prevails epidemically. It usually affects children and young persons, and is contagious.

The parotid gland swells; swelling beneath the ear, the chin, and all around the neck, deforming the countenance curiously.

It affects one side only sometimes, but usually both.

The swelling is hot, tender, and painful; the lower jaw can scarcely be moved. In about four days the disease begins to decline, and usually lasts in all about ten days.

Sometimes the swelling suddenly becomes transferred to the mammæ in the female and to the testicle in the male, and may oscillate between the throat and the mammæ or testicle. Metastasis to the brain is known to take place also, but this is rare.

TREATMENT.—Very little treatment is necessary. Apply warm cloths to the swelling; let them be kept on constantly.

If there is general feverishness, a tepid sponge bath and enema of tepid water. A little gruel or bran tea as food.

Keep the patient comfortably warm and quiet. If metastasis to the parts named occur, a warm sitz bath or fomentation to the affected region will give relief. Keep the feet warm.

Should the brain become affected, give *very hot* sitz and foot-bath for ten minutes. Follow this with enema of hot water. Apply cool cloths to the head, or, if more agreeable to the patient, warm spongings. Let the patient be kept in bed and seek to induce perspiration by applying bottles of hot water to the back and feet and drinking of hot water.

In fact, the treatment now should be the same as for inflammation of the brain.

DIPHTHERIA: ITS SYMPTOMS

In this to be dreaded and terrible disease, a false membrane forms in the throat, and if the larynx becomes affected the chances of recovery are very few indeed. Frequent vomiting, diarrhœa, hemorrhage from the nostrils or elsewhere, frequency and fulness of the pulse, convulsions, delirium, and coma, are symptoms which denote great danger. Occasionally the muscles of both the upper and lower limbs are affected. The chief objects in the treatment are to palliate symptoms, and support the powers of life by the judicious employment of tonic remedies, conjoined with alimentation and alcoholic stimulants. The latter are given in large quantities. The best advice to give to mothers in regard to diphtheria is, *send instantly for the doctor.* Do not delay one moment!

VARIOUS ACCIDENTS, WITH TREATMENTS

It is an accepted axiom that accidents will happen, no matter how well regulated the household; and, though much has been written with a view to avert the more serious calamities supposed to be the outcome of accident, but which are invariably the result of carelessness, children still manage to burn themselves at fires, to scald themselves with hot water, to cut their fingers, to break their heads, etc.

As a rule, the remedies required to be of any service should be applied at once; and it is, therefore, no earthly use suggesting antidotes or appliances only to be met with in a doctor's surgery. We shall, therefore, in the few suggestions we make, more particularly dwell upon those simple remedies which may reasonably be expected to be found in every home.

In the summer months, when the weather is seasonable, the heat is oftentimes sufficient to cause children to bleed at the nose. In such cases, if the bleeding be not excessive or too frequent, it is not desirable to stop it, as, when caused by an undue fulness of the blood-vessels of the head, it affords great relief. When, however, the bleeding is the result of a knock or blow, cold applications should be applied to the nose or forehead, and the child kept standing in the open air.

Another excellent way of arresting the bleeding is to cause the arms to be raised above the head, and kept so for a few minutes, which will usually have the desired effect. In the event of these remedies proving ineffectual, and it being evident that the bleeding is dangerous, the nostrils must be plugged with pieces of linen rag made into stoppers of oval shape, about one inch in the long diameter and half an inch in the transverse, sufficient linen being left hanging in order to withdraw them when necessary. The great thing to determine in cases where the bleeding is not the result of accident is whether it be a disease, or Nature's mode of assisting the removal of one.

TREATMENT OF CUTS

With regard to the bleeding caused by a cut from a knife, or something similarly sharp, if it be only slight, after being bathed with cold water, the edges or sides of the wound should be brought together and bound with narrow strips of arnica plaster, if this is to be had; but if not, a simple band of linen, smeared with the white of an egg, will be the best substitute. If the band becomes tight, and causes pain owing to the swelling, don't remove the bandage, but insert the blade of a pair of scissors underneath the binding on the opposite side to the wound, and cut the linen across. Where it is necessary to remove the strapping on account of there being pain and throbbing, the part affected should be soaked in warm water, and a soft, warm poultice applied. When the wound does not show signs of inflammation, and the discharge is good, that is to say, resembling cream in consistence and custard in color, the bandage may be put on again; but when the edges are inflamed, or pale and flabby, and the discharge thin and objectionable in its odor, a single strap of adhesive plaster should be used to keep the edges together, and this should be covered with a warm poultice.

When a mishap of this kind occurs, it is either a vein or an artery that is cut. In the former case the blood is dark-colored, and will flow in a steady stream, which can usually be stopped by the application of cold water or ice, and by exposing the wound to the open air. In the latter the blood is bright-red, and flows in jets, when, if the bleeding is excessive, a strong bandage should be tied around the limb, just above the wound, and between it and the heart, and compressed sufficiently tight (by means of a stick inserted underneath and twisted) until the circulation be stopped.

When the wound is not a clean cut, and there is any foreign substance, such as dirt, hair, etc., it must be carefully removed by sponging with cold water.

TREATMENT FOR BURNS

Accidents caused by burning demand immediate attention, and can only be cured in one way—by excluding the air from the part affected. Where it is a case of the clothes having caught fire, envelop the child in the heaviest article available, such as a blanket, tablecloth, curtain, etc., and roll it over and over on the ground until the flames are extinguished, in the event of there not being sufficient water at hand for that purpose.

This done, the charred garments should be quickly but most gently removed, and cut away, instead of being torn, from the body, in order that the damaged skin should not be unnecessarily irritated; but where a piece of the underlinen happens to be burned into the wound, or is not easily de-

tached, cut away all round it, and leave it to come away afterward. Then immediately cover the injured surface with something that will exclude the air, either with flour sprinkled thickly over the wound, with cotton-wool steeped in oil, or with a piece of linen on which is spread a layer of soap about the sixteenth of an inch thick. When procurable, a better remedy than either of those mentioned is to apply strips of lint saturated in carron oil, which dressing should be left on as long as possible until they become loosened or objectionable from the discharges, it being most desirable that these bandages be changed as seldom as possible, as their removal is apt to cause detachment of portions of the new skin, which is most painful and undesirable. Where there is much discharge it must be removed, and the place kept as clean as possible.

When the injury is of an extensive character, and a shock ensues, the shivering is best checked by the application of hot bottles to the hands and feet, and the administering of hot drinks—either warm sherry or warm brandy and water. To prevent disfigurement from accidents of this nature, the child must be carefully watched until the part is completely healed, and must be prevented from sitting, or lying in anything but a straight posture, to avoid contraction of the skin.

The danger attending burns depends more upon their superficial extent than the depth of the injury—those to the body, head, or neck being much more dangerous than those to the hands or feet, the neck being the most risky portion of all.

Where the part is simply blistered, though these be extensive in character and large in number, it is comparatively of little moment as long as they are whole. They must consequently not be broken, but allowed to remain, and the fluid to accumulate till the new skin forms underneath. When this formation takes place, the part becomes distended and painful, there is a red line round the edge of the blister, and the contained fluid looks milky. It may then be let out by puncturing with a needle, so that it all escapes.

TREATMENT FOR SCALDS

Scalds from hot water, as a rule, are not so severe, as, excepting in extreme cases, the scurf skin is only raised like an ordinary blister, and the dressing being wet, can be removed without difficulty. Any of the remedies prescribed for burns are equally efficacious for scalds, but if the scalded surface be instantly covered with cotton-wool, it is, if the accident be of a slight character, sufficient. Another admirable remedy, more particularly on account of its usually being "in the house," is lard. That specially prepared by chemists is, of course, the best; but this only means the ordinary kind divested of the salt by washing. It should be thickly spread on pieces of old, soft linen, and when placed on the scald or burn be kept in its place by bandages of lint, or, better still, by strips of calico torn from an old garment, always bearing in mind that the great thing is to protect the damaged part from the air, and remembering on no account to apply cold water or similar cold bandages.

TREATMENT FOR BRUISES

Bruises from knocks and tumbles are by far the most frequent of the numerous accidents of the nursery, and where the injury is slight and the skin not lacerated, a warm application of arnica (which should always be kept where there are children) and water, in the proportion of one part of arnica to ten of water, is advisable; but in the absence of this, the old-fashioned remedy of covering the bruise with fresh butter should be resorted to.

Jammed fingers, through the unexpected shutting of a drawer or door, though not usually looked upon as at all serious casualties, may sometimes be attended by the most serious consequences, for if all the parts of the end of the fingers be injured, the whole (bone and flesh) may mortify. In ordinary cases of this kind the best and quickest way of obtaining relief is to plunge the finger or fingers into warm water as hot as the child can bear it. By this means the nail is softened, and yields so as to accommodate itself to the blood poured out beneath it, and the pain is speedily lessened; the finger should then be covered with a bread and water poultice pending the surgical treatment necessary where the fingers are badly crushed.

Instant care and attention in such cases will often prevent the loss of the nail, a result to be avoided if possible, since the formation and growth of the new nail are necessarily slow, and changes of shape frequently occur, sometimes resulting in permanent disfigurement.

COMMON-SENSE TALK ABOUT FOOD

FOOD serves two purposes: it supplies the material of which the body is composed and the energy expended in heat and movement. According to the law of the conservation of matter and energy, no matter or energy is lost or gained in any transformation. Therefore there must be a perfect balance between the matter and the energy supplied to the body and that expended in any given time. The transformation of matter and of energy that takes place in the body is called metabolism, and is essentially a process of combustion.

All foods are combustibles, and they are transformed into much the same products by their utilization in the body as they are by burning in the air, and of course give off nearly the same amount of heat energy. We therefore speak of the "fuel value" of a food, and to determine it we can burn a small amount in compressed oxygen in a strong steel vessel immersed in water (a bomb calorimeter), and measure the amount of heat given off to the surrounding water.

Foods are principally composed of the four chemical elements: carbon, hydrogen, oxygen, and nitrogen. In the body the carbon is changed into carbon dioxide (carbonic acid, CO_2) by the oxygen of the air. The hydrogen combines with oxygen to form water (H_2O). The nitrogen is excreted as urea (CON_2H_4), a derivative of ammonia. Besides these four elements, the human body contains calcium, phosphorus, potassium, sulphur, chlorine, sodium, magnesium, iron, and fluorine in small quantities in the order named. Almost all vegetable and animal foods contain mineral matter (ash), composed of these elements, in such amount that, ordinarily, no attention need be paid to securing them.

Animals are not able to get the carbon, hydrogen, and nitrogen necessary for life from the free elements or their inorganic compounds, but have to use the complex organic compounds which form plants. Green plants are able to utilize the energy of the sunshine to prepare carbohydrates from carbon dioxide and water. The carbohydrates are again transformed in animals back to carbon dioxide and water; the potential energy released in the process going into heat and muscular work.

Of the potential energy supplied to us in the form of food, about 70 to 80 per cent passes off as heat, serving to keep the body at the

living temperature of about 98° Fahrenheit. The internal work of the body, such as breathing, forcing the blood through the arteries, digestion, thinking, etc., also appears as heat. The external energy produced by a man at moderate work amounts to some 20 to 30 per cent of the potential energy of his food. An ordinary steam-engine converts only about 5 per cent of the potential energy of its fuel into useful work, and the best engines, not more than 15 per cent.

ANIMAL AND VEGETABLE FOODS

THE COMPOSITION OF FOOD

WATER, although it can not be used as a source of energy, is a necessary ingredient of almost all foods, and when purchased as food, in the form of oysters or watermelons or strawberries, it is pretty expensive.

The most important constituents of food can be classified as carbohydrates, fats, and protein. All these enter into the normal diet, and although different in their uses, can replace each other to a certain extent. Protein demands the most attention because it is the only one of the three that contains nitrogen, and is, therefore, indispensable to the animal body. Familiar forms of protein are gluten of wheat, casein (curd) of milk, myosin of lean meat, albumen (white) of eggs, and gelatin of bones.

Protein is the material of the nitrogeneous portion of the body, the muscles, and the brain, also of the fats and carbohydrates. Carbohydrates include the numerous forms of sugar and starch, which make up the bulk of our food. Since they contain no nitrogen, they can not restore the waste of the body and build muscle, but serve only as fuel or sources of energy. The fats, which include all such substances as butter, lard, suet, oils, etc., are similar to the carbohydrates in composition and use, but have a greater fuel value. If any of the three are supplied in excess of present needs, they may be stored up in the body as fat, and utilized for producing energy at any future time.

The measure, or unit, of energy is the calorie, which is the amount of heat necessary to raise a litre (about one quart) of water one degree Centigrade (1.8 Fahr.) in temperature. It is equivalent to 3,060 foot-pounds, or a power sufficient to raise 3,060 pounds to the height of one foot. The fuel or energy value of the three classes of nutrients is approxin.ately as follows:

1 pound of	protein . .	gives	1860 calories heat
1 " "	carbohydrates	"	1860 " "
1 " "	fats . . .	"	4220 " "

THE CALCULATION OF DIETARIES

A satisfactory day's ration must conform to two requirements: It must contain enough protein to supply the waste of the body, and it must afford enough potential energy for the heat and muscular work needed. As an example of average and suitable dietaries the following may be given:

	Nutrients				Fuel value
	Total	Protein	Fats	Carbohydrates	
	Lbs.	Lbs.	Lbs.	Lbs.	Calories
Man with light exercise . .	1.32	.22	.22	.88	2,980
Man with moderate muscular work	1.55	.28	.28	1.00	3,520
Man at active muscular work	1.76	.33	.33	1.10	4,060

Women use about 20 per cent less food than men. For heavy and long-continued work a large amount of fuel-furnishing nutriment—fats and carbohydrates—is required. When brief and severe muscular or nervous strain is put upon a person, as, for example, in athletics, the protein should be increased. The amount of protein sometimes falls as low as .15 pound, and the total energy to 2,000 calories in poorly nourished people; and the dietary of some men working hard in the open air amounts to 6,000 or over.

FOOD COMBINATIONS

It would be impossible to make a satisfactory diet of potatoes alone, because they are so largely composed of carbohydrates that it would require an excessive amount

to supply the protein needed. They are, therefore, usually supplemented by meat or milk, which are rich in protein. Bread, which contains little fat, is improved by the addition of butter. Beans, which are the richest in protein of all vegetable foods, need carybohydrates and fats to balance the ration, and they are commonly eaten with pork and brown bread. The chemical composition does not tell the whole story, for the important factor of digestibility has to be considered. This, of course, varies with different individuals, and with the same individual at different times, so no general rule can be given.

DIGESTIBILITY OF FOODS

The digestibility of the nutrients classed under one name is not exactly the same. Vegetable protein is less digestible than animal protein. Carbohydrates are practically all digested, unless eaten in excess. A considerable quantity of fat may escape digestion, and therefore the fuel value of a ration may be overestimated. In a mixed diet of several kinds of food all components are more completely digested than when only one article of food is eaten.

A man may live and thrive on either animal food or vegetable food alone, but the general experience of the race, as well as the experimental evidence, favors the use of both. It is somewhat difficult to secure a sufficient amount of protein in a purely vegetable diet without getting an excess of carbohydrates. If milk, cheese, and eggs are used, flesh may easily be dispensed with.

VEGETABLE FOODS

Wheat is the chief food of Europe and America, as rice is of Oriental nations. Both grains are complete foods, and fairly well balanced. The gluten or gum of wheat eminently fits it for bread-making, as the dough can be aërated or leavened, and thus made more digestible. This is done by developing carbon dioxide during baking, either by means of yeast or baking powder. The growth of the yeast plant in the warm sponge produces alcohol and carbon dioxide, which are driven off by baking, leaving the bread porous. Baking powders consist of bicarbonate of soda and some other chemical, acting as a weak acid to evolve carbon dioxide. The acid substance may be lactic acid (in sour milk), potassium bitartrate (cream of tartar), calcium phosphate, or alum. The objection to the use of baking powder of any kind is that a salt unfit for food is left in. The salts left by the powders mentioned are, in the order named (1) Sodium lactate; (2) potassium-sodium-tartrate (Rochelle salt, as in Seidlitz powder); (3) calcium and sodium phosphate; and (4) ammonium and sodium sulphate and aluminum hydroxide. All these salts are medicinal in large doses, but it has not been proved experimentally that any one is much more deleterious than the others, nor that any of them in small quantities is injurious to a person of ordinary digestion.

Breakfast foods are wheat, oats, and maize preparations, often partly cooked. The three are very different in composition, oatmeal being richest in protein, corn in carbohydrates, and wheat intermediate in respect to both. The composition of each class of these foods is much the same, and they differ more in price and in the attractiveness of the advertising than in quality. Beans and peas supply more nitrogenous matter than other vegetables, because they have the power of obtaining nitrogen directly from the air, which most plants can not do.

FRUITS

(Except dates, grapes and bananas) contain very little nutriment, but are valuable for their flavor and acid juices. Nuts are not as nutritious as their composition would indicate, because the protein and carbohydrates are not very digestible. Cooking vegetables breaks up the grains of starch and makes it soluble.

ANIMAL FOODS

No animal foods contain carbohydrates except milk and liver. Animal foods are especially valuable on account of the large amounts of digestible protein and fats. There is little difference in the real nutritive value of cuts of meat sold at widely differing prices, and by proper cooking they may be made equally palatable and digestible. Gelatin extracted from the bones can not take the place of other forms of protein entirely, but is an easily digested food. Cooking meats develops attractive flavors and destroys bacteria and other disease germs.

CONDIMENTS AND ACCESSORIES

Substances of strong and pleasant flavor facilitate digestion by increasing the flow of digestive fluids, either by acting through the sense of taste or directly on the digestive organs. Salt, sugar, meat extract, cheese, pickles, mustard, pepper, and all

spices are of value for this reason. Excessive use injures the digestion. Salt is indispensable, as it is an important constituent of some of the juices of the body. Sugar is not merely a condiment, but a very nutritious food easily digested. Alcohol in small quantities is oxidized and serves as a source of energy. Its effect on the nervous system is more important than its food value. Tea and coffee contain caffein, and cocoa and chocolate contain theobromin, both alkaloids, which stimulate the nervous system. Meat extract is also more of a stimulant than a food.

FOOD ADULTERATION AND SUBSTITUTIONS

Injurious adulterations such as poisonous coloring matter, etc., have been almost entirely driven from the market by exposure, but there are many articles of food which are partly or wholly composed of cheaper materials than is claimed, and so cheat the purchaser. Ground spices are very largely adulterated with meal, ground nuts, etc. Coffee is adulterated with chicory and chicory with grain. This applies particularly to the packages of ground coffee, but sometimes imitation beans are molded. "Coffee extracts" sometimes have no trace of real coffee. Wheat flour is occasionally mixed with cheaper grains, such as corn. Baker's bread may be whitened by the addition of alum, an injurious substance when taken internally.

Cheap jellies are made from apple or gelatin, and flavored and colored to imitate various fruits. Strained honey and syrups are often largely composed of glucose. Glucose is made by the action of acid on starch, and is a valuable food, equal in nutritive value to cane sugar, but is much cheaper and not so sweet. Maple sugar is made from common sugar flavored with a decoction of bark. Artificial vinegar is made by diluting acetic acid, flavoring with apple juice and coloring with caramel. Milk is frequently diluted with water. Artificial fruit flavors are extensively used in drinks and candies. Some of these are identical with the natural product, as is methyl salicylate, which is oil of wintergreen, but more often they are merely imitations compounded of various ethers and alcohol. Glucose and starch are extensively used in candies.

Cottonseed oil is sold as olive oil, and used as a substitute for lard. It is a nutritious food product, and worthy of sale under its proper name. Oleomargarine, which is sometimes sold for butter, is made principally from beef fats. It has the advantage over butter that it does not so readily become rancid, and is less likely to contain disease germs, but is inferior in flavor. There is no difference in nutritive value or digestibility. Poor butter is usually colored with anatto. Sausages, jellies, candies, and drinks are often colored with aniline dyes, usually not injurious. Bright green pickles and peas are usually tinted with poisonous copper salts. Laws against adulteration are useful in preventing harmful ingredients being used, in publishing analyses of foods, and in ensuring the correct labelling of all articles on sale, but they are apt to be perverted in favor of some particular industry and to impose impossible conditions on certain legitimate, although it may be inferior, food products.

PRESERVATIVES

Food decomposes because of the growth of bacteria of putrefaction, and all methods of food preservation aim either to shut them out or to make the conditions such that they can not thrive. In canning and bottling, the contents are sterilized by heat and sealed so no micro-organisms can enter. Warmth and moisture are necessary for the development of bacteria, and, accordingly, cold storage and drying are efficient methods of preserving meat and fruit. Preserving may also be done by the use of some chemical antiseptic poisonous to bacteria, but not to man. Salt, saltpetre, borax, boric acid, salicylic acid, benzoic acid, formaldehyde, and many other chemicals are used for this purpose. Smoked meat must also be classed here, as it is coated with the tarry products of combustion.

In regard to all of these, it may be said that the processes of putrefaction and digestion are so similar in nature that whatever prevents the one will interfere to some extent with the other. At the same time it has not been proved definitely that any of these, except probably the last named, has any injurious effect upon a person of average digestive powers when used in the minute quantities necessary to preserve food. There is of course danger of using an excessive amount, and preservation by sterilizing, drying, or keeping cold is preferable to the addition of any foreign substance. Salt is an essential constituent of food, is easily washed out, and is distasteful in excess. The other preservatives are odorless and tasteless in small quantities.

A FEW LESSONS IN DANCING

ALTHOUGH dancing, like singing, is best learned from the instructions of a qualified master, it is possible that a determined student can teach himself what he wishes to know by carefully following printed rules and directions and practicing constantly and carefully. For the benefit of such, the following brief outlines are included here.

Some dances that were popular a few years since are now almost unknown, while others have come into vogue that were then, perhaps, uninvented. If a person can waltz, and perhaps dance a "two-step," and knows the figures of the lancers, he may be said to be a fairly good "dancing man." It is unnecessary to know all the new "fancy dances," although this is often a desirable accomplishment.

FAMILIAR DANCES OF THE PRESENT DAY

THE LANCERS

AT the present day the old-fashioned quadrille is seldom danced. It seems to have gone the way of the minuet and other graceful and complicated dances of our forefathers. In fact, the Lancers seems to be about the only "square dance" that is now performed, except on rare occasions. Within the last few years it has become a great favorite in fashionable circles. It admits of much skill and elegance in executing its quick and varied figures, a correct acquaintance with which is absolutely requisite to all who take part in it. Unlike the common quadrille, the Lancers must be danced by four couples only in each set; though of course there can be many sets dancing at the same time. The number being so limited, one awkward or ignorant person confuses the whole set; therefore, it is indispensable that every one who dances in this quadrille should have a thorough mastery of its graceful intricacies. We have observed that of late it has become the fashion to substitute new tunes and new figures for the old well-known music of the Lancers Quadrille. We can not consider this an improvement. The old simple melodies are peculiarly fitted to the sprightly, joyous character of the dance; which is more than can be said for any of the modern substitutes. When these are used, the Lancers, in our opinion, loses its individuality and spirit, becoming almost like a common quadrille. We should be heartily glad to see the old tunes restored, once for all, to their rightful supremacy.

The sets of four couples, top, opposite, and sides, having been arranged, the dance begins as follows:

1st Figure.—First lady and opposite gentleman advance and retreat; advance again, joining their hands; pass round each other and back to places. (1st eight bars.) Top couple join hands, and cross, opposite couple crossing at the same time, separately, outside them; the same reversed, back to places. (2d eight bars.) All the couples *balancez* to corners; each gentleman turns his neighbor's partner back to places. (3d eight bars.) Second couple repeat figure from beginning; after them side couples, those who stand to the right of top couple having always the priority, as in the common quadrille.

2d Figure.—First couple advance and re-

treat, gentleman holding lady's left hand; advance again; gentleman leaves his partner in the centre of the quadrille and retires to place. (1st eight bars.) *Balances* to each other and turn to places. (2d eight bars.) Side couples join first and second couples, forming a line of four on either side. Each line advances four steps, retreats ditto; then advances again, each gentleman reclaiming his partner, and all turn to places. Second and side couples repeat figure in succession.

3d Figure.—First lady advances four steps alone, and stops; *vis-à-vis* gentleman does the same; first lady retires, facing gentleman, to whom she makes a slow profound courtesy. (The courtesy must occupy a bar or two of the music; and as, if made with grace and dignity, it is most effective, we would recommend ladies to practice it carefully beforehand.) The gentleman at the same time bows and retires. (1st eight bars.) All four ladies advance to centre, give right hands across to each other (which is called the *double chain*), and left hand to *vis-à-vis* gentleman; then back again, left hands across in the middle, and right hands to partners back to places. (2d eight bars.) Second and side couples repeat figure from commencement.

A more recent fashion for dancing this figure is as follows: Instead of one lady advancing at first, all four advance, and courtesy to each other; then turn and courtesy to their partners. Ladies do the *moulinet* in the centre; that is, give right hands across to each other, and half round; left hands across back again, and return to places. Gentlemen meantime all move round outside the ladies, till each has regained his place. Figure as usual repeated four times; but the second and fourth time the gentlemen advance instead of the ladies, and bow, first to each other, then to their partners; continuing as before through the rest of the figure.

4th Figure.—Top gentleman, taking partner's left hand, leads her to the couple on their right, to whom they bow and courtesy (which civility must be met with the like acknowledgment), then cross quickly to fourth couple and do the same. (1st eight bars.) All four couples *chassez croisez* right and left (gentleman invariably passing behind his partner), then turn hands (*tour des mains*) back to places. (2d eight bars.) First and opposite couples right and left across and back again. (3d eight bars.) Second and sides repeat as usual.

5th Figure.—This figure commences with the music. Each couple should stand ready, the gentleman facing his partner, his right hand holding hers. If every one does not start directly the music begins, and does not observe strict time throughout, this somewhat intricate figure becomes hopelessly embarrassed; but, when well danced, it is the prettiest of the set. It commences with the *grande chaine* all round; each gentleman giving his right hand to his partner at starting, his left to the next lady, then his right again, and so all round, till all have returned to their places. (This occupies sixteen bars of the music.) First couple promenade inside figure, returning to places with their backs turned to opposite couple. The side couple on their right falls in immediately behind them; the fourth couple follows, the second couple remaining in their places. A double line is thus formed—ladies on one side and gentlemen on the other. (3d eight bars.) All *chassez croisez*, ladies left, gentlemen right, behind partners. First lady leads off, turning sharply round to the right; first gentleman does the same to the left, meeting at the bottom of the quadrille, and promenade back to places. All the ladies follow first lady; all the gentlemen follow first gentleman; and as each meets his partner at the bottom of the figure, they touch hands, then fall back in two lines—ladies on one side, gentlemen on the other—facing each other. (4th eight bars.) Four ladies join hands, advance, and retreat; four gentlemen ditto at the same time; then each turns his partner to places. (5th eight bars.) *Grande chaine* again. Second and side couples repeat the whole figure in succession, each couple taking its turn to lead off, as the first has done. *Grande chaine* between each figure and in conclusion.

THE LANCERS FOR SIXTEEN, OR DOUBLE LANCERS

1st Figure.—Two first ladies and *vis-à-vis* gentlemen begin at the same moment, and go through the figure as in Single Lancers. All *balancez* to corners; in other words, each lady sets to gentleman at her right, who turns her to her place. Second couples and sides repeat as usual.

2d Figure.—First couples advance, retreat, advance again, leaving ladies in centre; set to partners and turn to places. Two side couples nearest first couples join them; two side couples nearest second couples do the same, thus forming eight in each line. They all advance and retreat, holding hands, then

turn partners to places. Repeated by second and side couples as usual.

3d Figure.—First ladies advance and stop; *vis-à-vis* gentlemen ditto; courtesy profoundly, bow, and back to places. Ladies do the *moulinet*, gentlemen go round outside, and back to places. Or, ladies advance and courtesy to each other and then to partners; gentlemen doing the same when the second and fourth couples begin the figure, as in Single Lancers.

4th Figure.—First couples advance to couples on their right; bow and courtesy; cross to opposite side, bow and courtesy, *chasses croisez*, and return to place. Right and left to opposite places, and back again. Second couples and sides repeat figure.

5th Figure.—Grande chaine all round, pausing at the end of every eight bars to bow and courtesy; continue *chaine* back to places, which will occupy altogether thirty-two bars of the music. Figure almost the same as in Single Lancers. Both first couples lead around, side couples falling in behind, thus forming four sets of lines. Figure repeated by second and side couples; *grande chaine* between each figure and at the conclusion.

THE POLKA

The origin of this once celebrated dance is difficult to ascertain. It is believed by some to be of great antiquity, and to have been brought into Germany from the East. Others affirm that its origin is of more recent date, and its birthplace considerably nearer home. An authority on these matters remarks: "In spite of what those professors say who proclaim themselves to have learned the Polka in Germany, or as being indebted for it to an Hungarian nobleman, we are far from placing confidence in their assertions. In our opinion Paris is its birthplace, and its true author, undoubtedly, the now far-famed Monsieur Cellarius, for whom this offspring of his genius has gained a European celebrity."

Whatever we may be inclined to believe with regard to this disputed question, there can be no doubt of the widespread popularity which for many years was enjoyed by the Polka. When first introduced in 1843, it was received with enthusiasm, and it effected a complete revolution in the style of dancing which had prevailed up to that period. A brisk, lively character was imparted even to the steady-going quadrille; the old *Valse à Trois Temps* was pronounced insufferably "slow"; and its brilliant rival, the *Valse à Deux Temps*, which had been recently introduced, at once established the supremacy which it has ever since maintained. The *galop*, which had been until this period only an occasional dance, now assumed a prominent post in every ballroom, dividing the honors with the valse.

Perhaps no dance affords greater facilities for the display of ignorance or skill, elegance or vulgarity, than the Polka. The step is simple and easily acquired, but the method of dancing it varies *ad infinitum*. Some persons race and romp through the dance in a manner fatiguing to themselves and dangerous to their fellow-dancers. Others (though this is more rare) drag their partner listlessly along, with a sovereign contempt alike for the requirements of the time and the spirit of the music. Some gentlemen hold their partner so tight that she is half suffocated; others hold her so loosely that she continually slips away from them. All these extremes are equally objectionable, and defeat the graceful intention of the dance. It should be performed quietly, but with spirit, and *always in strict time*. The head and shoulders should be kept still, not jerked and turned at every step, as is the manner of some. The feet should glide swiftly along the floor—not hopping or jumping as if the boards were red-hot.

You should clasp your partner lightly but firmly round the waist with your right arm.

Your left hand takes her right hand; but beware of elevating your arm and hers in the air, or holding them out straight, which suggests the idea of windmills.

Above all, never place your left hand on your hip or behind you. In the first place you thus drag your partner too much forward, which makes her look ungraceful; in the next, this attitude is *never used* except in casinos, and it is almost an insult to introduce it in a respectable ballroom.

Let the hand which clasps your partner's fall easily by your side in a natural position, and keep it there. Your partner's left hand rests on your right shoulder; her right arm is thrown a little forward toward your left.

The Polka is danced in 2-4 time. There are three steps in each bar; the fourth beat is always a rest.

It is next to impossible to describe in words the step of the Polka, or of any circular dance; nothing but example can correctly teach it; and although we shall do our best to be as clear as possible, we

would earnestly recommend those of our readers who desire to excel, whether in this or the following dances, to take a few lessons from some competent instructor.

The gentleman starts with his left foot, the lady with her right. We shall describe the step as danced by the gentleman; the same directions, reversing the order of the feet, will apply to the lady.

1st beat.—Spring slightly on right foot, at the same time slide left foot forward.

2d beat.—Bring right foot forward by *glissade*, at the same time raising left foot.

3d beat.—Bring left foot slightly forward and *fall* upon it, leaving right foot raised, and the knee slightly bent, ready to begin the step at the first beat of the next bar.

4th beat.—Remain on left foot. Begin next bar with the right foot, and repeat the step to end of the third beat. Begin the following bar with left foot, and so on, commencing each bar with right or left foot alternately.

The Polka is danced with a circular movement, like the Valse; in each bar you half turn, so that by the end of the second bar you have brought your partner completely round.

The circular movement of the Polka admits of two directions—from right to left or from left to right. The ordinary direction is from right to left. The opposite one is known as the *reverse* step. It is more difficult to execute, but is a pleasant change for skilled dancers, if they have become giddy from turning too long in one direction.

In dancing the Polka, or any circular dance where a large number of couples are performing at the same time, the gentleman must be careful to steer his fair burden safely through the mazes of the crowded ballroom. A little watchfulness can almost always avoid collisions, and a good dancer would consider himself disgraced if any mishap occurred to a lady under his care. Keep a sharp lookout, and avoid crowded corners. Should so many couples be dancing as to render such caution impossible, stop at once and do not go on until the room has become somewhat cleared. In a few minutes others will have paused to rest, and you can then continue. Your partner will be grateful that your consideration has preserved her from the dismal plight in which we have seen some ladies emerge from this dance—their *coiffures* disordered, their dresses torn, and their cheeks crimson with fatigue and mortification, while their indignant glances plainly showed the anger they did not care to express in words, and which their reckless partner had fully deserved. A torn dress is sometimes not the heaviest penalty incurred: we have known more than one instance where ladies have been lamed for weeks through the culpable carelessness of their partners; their tender feet having been half crushed beneath some heavy boot in one of these awkward collisions. This is a severe price to pay for an evening's amusement, and gentlemen are bound to be cautious how they inflict it or anything approaching to it, upon their fair companions. Ladies, on the other hand, will do well to remember that by leaning heavily upon their partner's shoulder, dragging back from his encircling arm, or otherwise impeding the freedom of his movements, they materially add to his labor and take from his pleasure in the dance. They should endeavor to lean as lightly and give as little trouble as possible; for, however flattering to the vanity of the nobler sex may be the idea of feminine dependence, we question whether the reality, in the shape of a dead weight upon their aching arms throughout a Polka or a Valse of twenty minutes' duration, would be acceptable to even the most chivalrous among them.

We have been thus minute in our instructions, because they not only apply to the Polka, but equally to all circular dances where a great number stand up to dance at the same time. We now pass on to the Mazourka.

The time of the Mazourka is ¾, like the common Valse; but it should be played much more slowly; if danced quickly, it becomes an unmeaning succession of hops, and its graceful character is destroyed.

We describe the step as danced by the lady; for the gentleman it will be the same, with the feet reversed; that is, for right foot read left, and so on.

FIRST STEP

1st and 2d beats.—Spring on left foot, sliding forward right foot at the same time, and immediately let your weight rest on the forward foot. This occupies two beats.

3d beat.—Spring on right foot; this ends the bar.

2d bar, 1st and 2d beats.—Spring again on right foot, and slide forward left at same time. Rest on it a moment as before during second beat; at third beat spring on it, which ends second bar. Continue same step throughout. You will perceive that, at the first and third beats of the time, you

hop slightly, resting, during the second beats, on the foremost foot.

SECOND STEP

1st beat.—Spring on left foot, slightly striking both heels together.

2d beat.—Slide right foot to the right, bending the knee.

3d beat.—Bring the left foot up to right foot with a slight spring, raising right foot; which ends the first bar.

2d bar, 1st beat.—Spring again on left foot, striking it with heel of right.

2d beat.—Slide right foot to the right.

3d beat.—Fall on right foot, raising left foot behind it, which ends the second bar. Reverse the step by springing first on the right foot, and sliding the left, etc. The music generally indicates that this step should be repeated three times to the right, which occupies three bars, then *rest* during the fourth bar, and return with reverse step to the left during the three bars which follow, resting again at the eighth bar.

THIRD STEP

1st beat.—Spring on left foot, and slide right foot to the right.

2d beat.—Rest on right foot.

3d beat.—Spring on right foot, bringing left foot up behind it.

2d bar, 1st beat.—Spring on right foot, sliding left foot to the left.

2d beat.—Rest on left foot.

3d beat.—Hop on left foot, bringing right behind as before. Continue at pleasure.

The first of these three steps is most commonly used in the Valse; but the second is an agreeable change for those who may have grown giddy or weary in doing the *figure en tournant* (circular movement).

Be careful not to exaggerate the slight hop at the first and third beats of each bar, and to *slide* the foot gracefully forward, not merely to make a step, as some bad dancers do.

THE MAZOURKA QUADRILLE

This elegant quadrille has five figures, and can be performed by any even number of couples. The music, like the step, is that of the Mazourka. The couples are arranged as in the ordinary quadrille.

Join hands all round; *grand rond* to the left (four bars), then back again to the right (four bars), employing the *second* step of the Mazourka. Each couple does the *petit tour* forward and backward, still using the second step, and repeating it three times to the right—then resting a bar; three times to the left—then resting another bar; which occupies eight bars of the music. These figures may be considered as preliminary.

1st Figure.—Top and bottom couples right and left (eight bars), with Redowa step;* then they advance, the ladies cross over, the gentlemen meanwhile pass quickly round each other, and return to own places (four bars); *petit tour* forward with opposite ladies (four bars); right and left (eight bars); advance again; the ladies return to own places, and the gentlemen pass again round each other to their own ladies (four bars); *petit tour* backward (four bars). Side couples do likewise.

2d Figure.—(Eight bars rest.) Top and bottom couples advance and retire, hands joined (four bars). All cross over into opposite places, each going to each other's left (four bars); *petit tour* forward (four bars); advance and retire (four bars), and return to places (four bars); *petit tour* (four bars). Side couples do likewise.

3d Figure.—(Eight bars rest.) Top and bottom ladies cross over into opposite places (four bars); return, presenting left hand to each other, and right hand to partner, as in *La Poule* (four bars); pass round with partners into opposite places (four bars); *petit tour* backward (four bars); *vis-à-vis* couples hands across, round (six bars); retire (two bars); top and bottom ladies cross over (four bars); ladies cross again, giving each other left hands, and right to partners (four bars). All pass round to own places (four bars); *petit tour* backward (four bars).

4th Figure.—(Eight bars rest.) Top couple lead round inside the figure (eight bars); *petit tour* forward and backward (eight bars); advance to opposite couple; the gentleman turns half round without quitting his partner, and gives his left hand to opposite lady; the two ladies join hands behind gentleman (four bars); in this position the three advance and retire (eight bars). The gentleman passes under the ladies' arms; all three pass round to the left, with second step of Mazourka, the opposite lady finishing in her own place (four bars). The top couple return to places (four bars); *petit tour* forward (four bars). Opposite couple and side couples do likewise.

5th Figure.—(Eight bars rest.) Top and bottom couples half right and left (four

* This step will be found further on under the head of Redowa Valse.

bars); *petit tour* backward (four bars); half right and left to places (four bars); *petit tour* backward (four bars); *vis-à-vis* couples hands round to opposite places (four bars); *petit tour* forward (four bars); hands round to own places (four bars); *petit tour* (four bars); right and left (eight bars).

Side couples do likewise.

Finale.—Grand round all to the left, and then to the right (sixteen bars); grand chain, as in the Lancers, with first step of Mazourka (sixteen bars). But if there are more than eight in the quadrille, the music must be continued until all have regained their places.

N.B.—Music continues during rests.

THE POLKA MAZOURKA

The step of this dance is, as its name implies, a mixture of the steps of the Polka and the Mazourka. The time is ⅜ quicker than that of the Mazourka.

Gentleman takes his partner as in the Valse. *Figure en tournant.* We describe the steps for the gentleman; the lady simply reverses the order of the feet, using left foot for right throughout.

1st beat.—Rest on right foot, with left foot a little raised behind, and slide left foot to the left.

2d beat.—Spring on the right foot, bringing it up to where left foot is, and raising the latter in front.

3d beat.—Spring once more on right foot, passing left foot behind without touching the ground with it; this ends first bar.

2d bar, 1st beat.—Slide left foot to the left, as before.

2d beat.—Spring on right foot, as before, and bring it up to the place of left foot, raising latter at same moment.

3d beat.—Fall on the left foot, and raise the right foot behind; end of second bar.

Begin third bar with right foot, and continue as before. You turn half round in the first three beats, and complete the circle in the second three.

THE REDOWA, OR REDOVA

The step of this Valse somewhat resembles that of the Mazourka, and is used, as we have seen, in dancing the Mazourka Quadrille. It is an elegant Valse, not so lively as the Polka Mazourka, but, if danced in correct time, not too slowly, is very graceful and pleasing. The step is not so difficult as that of the Mazourka: it is almost a *Pas de Basque,* with the addition of the hop. In all these dances, which partake of the nature of the Mazourka, it is requisite to mark distinctly the first and third beats of every bar, otherwise the peculiar character of the movement is completely lost. We describe the step for the lady as it is employed in the forward movement.

1st beat.—Stand with right foot slightly forward; spring upon it, bringing it behind left foot, which is raised at same time.

2d beat.—Slide your left foot forward, bending the knee.

3d beat.—Bring your right foot, with a slight hop, up behind your left foot, raising the latter and keeping it in front. (One bar.)

1st beat.—Spring upon your left foot, passing it behind your right, and raising latter.

2d beat.—Slide right foot forward, bending the knee.

3d beat.—Bring left foot up to right, with slight hop, and raise right foot at same moment, keeping it in front as before.

When the *figure en tournant* (circular movement) is employed, the lady begins by sliding the left foot forward and the right foot backward. Gentleman always does the same, with order of feet reversed.

This dance has been very popular in Paris: in England it is now seldom seen.

THE SCHOTTISCHE

The Schottische was introduced about the same time as the Polka Mazourka. Its origin is as uncertain as that of the Polka, and it is believed to be a very ancient national dance. It is a great favorite with the German peasantry; and although its name, *Schottische,* would seem to imply that it came from Scotland, there is no doubt that it is essentially German alike in character and in music.

The step, although easy to learn, requires great precision. We would recommend our readers to adhere throughout to the circular movement. Some dancers begin by four steps to the right, then back again, not turning until they commence the second half of the figure. But when many couples are dancing this practice involves a risk of collisions, and it is safer to begin at once with the *figure en tournant.* The second part of the step consists of a series of slight hops, which must be made exactly at the same moment by both parties, otherwise a breakdown is inevitable. They should be executed as quickly as possible, so as to avoid the *jigging* effect which bad dancers impart to the Schottische. When well per-

formed it is a very animated and elegant dance, forming an agreeable variety to the Polka and Valse.

The time is 2-4; it should be played a good deal slower than the Polka; when hurried it becomes ungraceful and vulgar. The first and third beat in each bar should be slightly marked.

We proceed to describe the step as danced by the gentleman.

Slide the left foot forward; bring right foot close behind left foot. Slide left foot forward a second time. Spring upon left foot. Then do the same with right foot.

Having completed four steps, first with the left foot, and then with the right, you come to the second part, which consists of a series of double hops, two on each foot alternately. Hop twice on the left foot (one hop for each beat of time), and half turn round; then twice on the right, completing the circular movement. Repeat the same through another four beats; then resume first step through the next two bars, and continue to alternate them every second bar. You can also vary the dance at pleasure, by continuing the first step without changing it for the hops; or you can likewise continue these throughout several bars in succession, taking care, of course, to apprise your partner of your intention. Even when well and quietly danced, there is something undignified in the hopping movement of the second step; and we have observed with satisfaction that for some time past it has been replaced by the step of the *Valse à Deux Temps,* which is now generally used instead of the double hops.

THE WALTZ

Forty years ago the Waltz was a stately measure, danced with gravity and deliberation. Each couple wheeled round and round with dignified composure, never interrupting the monotony of the dance by any movements forward or backward. They consequently soon became giddy, although the music was not played above half as fast as the Valse music of our day. We are bound to admit that this stately fashion of waltzing was infinitely more graceful than the style which has superseded it. But having confessed so much, we may venture to add that the Valse, as danced by the present generation, possesses a spirit, lightness, and variety quite unknown to its stately predecessor.

Although we can not regret the introduction of a more animated style of dancing, we are sorry that the old Waltz has been so entirely given up. When restored to its original *temps,* the *Valse à Trois Temps* is nearly as spirited as the *Valse à Deux,* and twice as graceful. It has the additional advantage over the latter, that it contains in each bar three steps to three beats of the time, whereas the *Deux Temps,* as its name implies, numbers only two steps in a bar of three notes; and is thus incorrect in time. We venture to predict that the old Waltz will, at no distant day, be restored to public favor.

Gentleman takes his partner round the waist with his right arm; his left hand holds hers as in the Polka. Lady places left hand on his shoulder, and right hand in his left hand. Begin at once with the *figure en tournant.* Time ¾; one step to each beat. First beat in each bar should be slightly marked by the dancers.

1st beat.—Slide left foot backward, toward the left.

2d beat.—Slide your right foot past your left in same direction, keeping right foot behind left, and turning slightly to the right.

3d beat.—Bring left foot up behind right (one bar).

1st beat.—Slide right foot forward toward the right.

2d beat.—Slide left foot forward, still turning toward right.

3d beat.—Bring right foot up to right, turning on both feet, so as to complete the circle (two bars). Remember to finish with right foot in front. Repeat from first beat of first bar. Gentleman always turns from left to right; lady from right to left.

The step of the Waltz is simple enough; nevertheless some practice is required to dance it really well. Remember always to *slide,* not to *step,* forward; for the beauty of this Valse consists in its gliding motion. It is not at first easy to dance swiftly and quietly at the same time; but a little patience will soon enable you to conquer that difficulty, and to do full justice to what is, in our opinion, the most perfectly graceful of all the round dances, without a single exception.

VALSE A DEUX TEMPS, OR TWO-STEP

We are indebted to the mirth-loving capital of Austria for this brilliant Valse.

This Valse is incorrect in time. Two steps can never properly be made to occupy the space of three beats in the music. The ear requires that each beat shall have its step. This inaccuracy in the measure has exposed the *Valse à Deux Temps* to the

just censure of musicians, but has never interfered with its success among dancers. We must caution our readers, however, against one mistake often made by the inexperienced. They imagine that it is unnecessary to observe any rule of time in this dance, and are perfectly careless whether they begin the step at the beginning, end, or middle of the bar. This is quite inadmissible. Every bar must contain within its three beats two steps. These steps must begin and end strictly with the beginning and end of each bar, otherwise a hopeless confusion of the measure will ensue. Precision in this matter is the more requisite, because of the peculiarity in the measure. If the first step in each bar be not strongly marked, the Valse measure has no chance of making itself apparent, and the dance becomes a meaningless *Galop*.

The step contains two movements, a *glissade* and a *chassez*, following each other quickly in the same direction. Gentleman begins as usual with his left foot; lady with her right.

1st beat.—*Glissade* to the left with left foot.

2d and 3d beats.—*Chassez* in the same direction with right foot; do not turn.

2d bar, 1st beat.—Slide right foot backward, turning half round.

2d and 3d beats.—Pass left foot behind right, and *chassez* forward with it, turning half round to complete the *figure en tournant*. Finish with right foot in front, and begin over again with left foot.

There is no variation in this step; but you can vary the movement by going backward or forward at pleasure, instead of continuing the rotary motion. The *Valse à Deux Temps*, like the Polka, admits of a reverse step, but it looks awkward unless executed to perfection. The first requisite in this Valse is to avoid all jumping movements. The feet must glide smoothly and swiftly over the floor, and be raised from it as little as possible. Being so very quick a dance, it must be performed quietly, otherwise it is liable to become ungraceful. The steps should be short, with knees slightly bent.

As the movement is necessarily very rapid, the danger of collision is proportionately increased; and gentlemen will do well to remember and act upon this hint.

They should also be scrupulous not to attempt to conduct a lady through this Valse until they have thoroughly mastered the step and well practiced the *figure en tournant*. Awkwardness or inexperience doubles the risks of a collision, which, in this extremely rapid dance, might be attended with serious consequences.

The *Deux Temps* is a somewhat fatiguing Valse, and after two or three turns around the room, the gentleman should pause to allow his partner to rest. He should be careful to select a lady whose height does not present too striking a contrast to his own; for it looks ridiculous to see a tall man dancing with a short woman, or *vice versâ*. This observation applies to all round dances, but especially to the Valse.

THE GALOP

The Galop, as its name implies, is the quintessence of all the "fast" dances. At the time of the Polka mania it was very much in vogue, and almost as great a favorite as the *Deux Temps*. Although its popularity has greatly declined of late, it generally occurs twice or thrice in the programme of every ballroom; and the music of the Galop is, like the dance itself, so gay and spirited, that we should regret to see it wholly laid aside. The step is similar to that of the *Deux Temps Valse*, but the time is 2-4, and as quick as possible. Two *chassez* steps are made in each bar. The figure can be varied by taking four or eight steps in the same direction, or by turning with every two steps, as in the *Deux Temps*. Like all round dances, it admits of an unlimited number of couples. Being, perhaps, the most easy of any, every one takes part in it, and the room is generally crowded during its continuance. A special amount of care is therefore necessary on the part of the gentleman to protect his partner from accidents.

THE COTILLON

The Cotillon is never commenced till toward the close of the ball, at so advanced an hour that all the sedate portion of the assembly have retired, and only the real lovers of dancing remain.

There are many varieties of figures, but the following description will suffice. As the Cotillon is danced differently in every city, and with every variety of figure that the ingenuity of Cotillon leaders can invent, it is impossible to give more than a bare outline of this favorite amusement of young society people.

A circle of chairs is arranged round the room, the centre being left clear; the spectators stand behind the chairs so as not to interfere with the dancers. Each gentleman leads his partner to a seat, taking another beside her. To these same seats they return after every figure, it being the eti-

quette of the dance that no couple should appropriate any chairs but their own, taken at the commencement. When the dancers are arranged round the room, the orchestra strikes up the spirited music of the Cotillon, which consists of a long series of Valse movements at the usual *tempo* of the *Deux Temps*. There are generally several leaders of the Cotillon, who decide upon the succession of the figures. If there are many couples dancing, one leader attends upon a group of six or eight couples, to ensure that all shall take part. We are aware of no fixed rule for the succession of the figures, which depends upon the caprice of the leaders. A good leader will invent new combinations, or diversify old figures, thus securing an almost endless variety. One of the most popular is:

Several gentlemen assume the names of flowers or plants, such as the honeysuckle, woodbine, ivy, etc. A lady is then requested to name her favorite flower, and the fortunate swain who bears its name springs forward and valses off with her in triumph. It is usual to make one, or at most two, turns round the room, and then restore the lady to her own partner, who in the meantime has perhaps been the chosen one of another lady. All having regained their places, each gentleman valses with his own partner once round the room, or remains sitting by her side, as she may feel inclined.

Baskets filled with small bouquets are brought in. Each gentleman provides himself with a bouquet, and presents it to the lady with whom he wishes to valse.

Sometimes a light pole or staff is introduced, to the top of which are attached long streamers of different colored ribbons. A lady takes one of these to several of her fair companions in turn, each of whom chooses a ribbon, and, holding it firmly in her hand, follows the leading lady to the centre of the room. Here they are met by an equal number of gentlemen, likewise grouped round a leader who carries the pole, while each holds a streamer of his favorite color, or that which he imagines would be selected by the *dame de ses pensées*. The merry groups compare notes: those who possess streamers of the same color pair off in couples and valse round the room, returning to places as before.

Six or eight ladies, and the same number of gentlemen, form in two lines, facing each other. The leading lady throws a soft worsted ball of bright colors at the gentleman with whom she wishes to dance. He catches it, throws it back to the fair group, and valses off with his partner. Whoever catches the returning ball has the right to throw next; and the same ceremony is repeated until all have chosen their partners, with whom they valse round the room, returning to places as usual. Sometimes a handkerchief is substituted for the ball; but the latter is better, being more easily thrown and caught.

Six or eight chairs are placed in a circle, the backs turned inward. Ladies seat themselves in the chairs, gentlemen move slowly round in front of them. Each lady throws her handkerchief or bouquet at the gentleman with whom she wishes to dance as he passes before her; valse round as usual, and return to places. Sometimes a gentleman is blindfolded and placed in a chair. Two ladies take a seat on either side of him, and he is bound to make his selection without seeing the face of his partner. Having done so, he pulls the covering from his eyes and valses off with her. It is a curious circumstance that mistakes seldom occur, the gentleman being generally sufficiently *clairvoyant* to secure the partner he desires.

We have here described a few of the most striking figures of the Cotillon. We might multiply them to an extent which would equally tax the patience of our readers and our own powers of remembrance, but we forbear. Favors and souvenirs are given.

SIR ROGER DE COVERLEY, OR VIRGINIA REEL

Sir Roger de Coverley, or Virginia Reel, is always introduced at the end of the evening, and no dance could be so well fitted to send the guests home in good humor with each other and with their hosts. We describe it as it is danced at the present day, slightly modernized to suit the taste of our time. Like the quadrille, it can be danced with equal propriety by old or young, and is so easy that the most inexperienced dancer may fearlessly venture to take part in it.

Form in two parallel lines; ladies on the left, gentlemen on the right, facing partners. All advance; retreat (which occupies the first four bars); cross to opposite places (four bars more); advance and retreat (four bars); re-cross to places (four bars).

The lady who stands at the top and the gentleman who stands at the bottom, of each line, advance toward each other, courtesy and bow, and retire to places. The gentleman at the top and the lady at the bottom do the same. Lady at top and gentleman at bottom advance again, give right hands, and swing

quickly round each other back to places. Gentleman at top and lady at bottom do the same. Top lady advances, gives right hand to partner opposite, and passes behind the two gentlemen standing next to him. Then through the line and across it, giving left hand to partner, who meets her half way between the two lines, having in the meantime passed behind the two ladies who stood next his partner. Lady then passes behind the two ladies next lowest; gentleman at same time behind the two gentlemen next lowest; and so on all down the line. At the bottom, lady gives left hand to her partner, and they promenade back to places at the top of the line. (This figure is frequently omitted.) Top couple advance, courtesy and bow, then lady turns off to the right, gentleman to the left, each followed by the rest of her or his line. Top couple meet at the bottom of figure, join hands, and raising their arms, let all the other couples pass under them toward the top of the line, till all reach their own places, except the top, who have now become the bottom couple. Figure is repeated from the beginning, until the top couple have once more worked their way back to their original places at the top of the line.

GLOSSARY

We subjoin a Glossary of all the French words and expressions that have long since been universally accepted as the accredited phraseology of the ball-room.

A vos places, *back to your own places.*
A la fin, *at the end.*
A droite, *to the right.*
A gauche, *to the left.*
Balancez, *set to your partners.*
Balancez aux coins, *set to the corners.*
Balancez quatre en ligne, *four dancers set in a line, joining hands, as in La Poule.*
Balancez en moulinet, *gentlemen and their partners give each other right hands across, and* balancez *in the form of a cross.*
Balancez et tour des mains, *all set to partners, and turn to places.* (*See* Tour des mains.)
Ballotez, *do the same four times without changing your places.*
Chaine Anglaise, *opposite couples right and left.*
Chaine des dames, *ladies' chain.*
Chaine Anglaise double, *double right and left.*
Chaine des dames double, *all the ladies perform the ladies' chain at the same time.*
Chassez croisez, *do the* chassé *step from left to right, or right to left, the lady passing before the gentleman in the opposite direction, that is, moving right if he moves left, and vice versa.*
Chassez croisez et déchassez, *change places with partners, ladies passing in front, first to the right, then to the left, back to places. It may be either* à quatre—*four couples—or* les huit—*eight couples.*
Chassez à droite—a gauche, *move to the right—to the left.*
Le cavalier seul, *gentleman advances alone.*
Les cavaliers seuls deux fois, *gentlemen advance and retire twice without their partners.*
Changez vos dames, *change partners.*
Contre partie pour les autres, *the other dancers do the same figure.*
Demi promenade, *half promenade.*
Demi chaine Anglaise, *half right and left.*
Demi moulinet, *ladies all advance to centre, right hands across, and back to places.*
Demi tour à quatre, *four hands half round.*
Dos-à-dos, *lady and opposite gentleman advance, pass round each other back to back, and return to places.*
Les dames en moulinet, *ladies give right hands across to each other, half round, and back again with left hands.*
Les dames donnent la main droit—gauche—à leurs cavalier, *ladies give the right—left—hands to partners.*
En avant deux et en arrière, *first lady and* vis-à-vis *gentleman advance and retire. To secure brevity,* en avant *is always understood to imply* en arrière *when the latter is not expressed.*
En avant deux fois, *advance and retreat twice.*
En avant quatre, *first couple and their* vis-à-vis *advance and retire.*
En avant trois, *three advance and retire, as in La Pastorale.*
Figurez devant, *dance before.*
Figurez à droite—à gauche, *dance to the right—to the left.*
La grande tour de rond, *all join hands and dance completely round the figure in a circle back to places.*
Le grand rond, *all join hands, and advance and retreat twice, as in La Finale.*
Le grand quatre, *eight couples form into squares.*
La grande chaine, *all the couples move quite round the figure, giving alternately the right and left hand to each in succession, beginning with the right, until all have regained their places, as in last figure of the Lancers.*
La grande promenade, *all eight (or more) couples promenade all around the figure back to places.*
La main, *the hand.*
La meme pour les cavaliers, *gentlemen do the same.*
Le moulinet, *hand across. The figure will explain whether it is the gentlemen, or the ladies, or both, who are to perform it.*
Pas de Allemande, *the gentleman turns his partner under each arm in succession.*
Pas de Basque, *a kind of sliding step forward, performed with both feet alternately in quick succession. Used in the Redowa and other dances. Comes from the South of France.*
Glissade, *a sliding step.*
Le Tiroir, *first couple cross with hands joined to opposite couple's place, opposite couple crossing separately outside them; then cross back to places, same figure reversed.*
Tour des mains, *give both hands to partner, and turn her round without quitting your places.*
Tour sur place, *the same.*
Tournez vos dames, *the same.*
Tour aux coins, *turn at the corners, as in the Caledonians, each gentleman turning the lady who stands nearest his left hand, and immediately returning to his own place.*
Traversez, *cross over to opposite place.*
Retraversez, *cross back again.*
Traversez deux, en donnant la main droite, *lady and* vis-à-vis *gentleman cross, giving right hand, as in La Poule.*
Vis-à-vis, *opposite.*
Figure en tournant, *circular form.*

RULES FOR PARLIAMENTARY PROCEDURE

A PUBLIC meeting is the assemblage of a portion of the people, for the expression of opinion upon matters of local or general concern, The proceedings are but few and simple; yet, to preserve order during its session, and to give effect to its action, the meeting has to be guided by defined rules from the time of its projection to the moment of its close. Even when only a few persons are present, and the proceedings are more or less informal, it is desirable to apply parliamentary rules to the extent, at least, of choosing officers and conducting business in orderly and expeditious fashion.

ORGANIZING AND CONDUCTING MEETINGS

ORGANIZING ASSOCIATIONS

WHEN it is advisable to form a society, club, or other association, for any specific purpose, those who agree in regard to its formation may meet upon private notice or public call. The mode of organizing the meeting is similar to that of any other.

As soon as the meeting has been organized, and the chairman announces that it is ready to proceed to business, some one of the originators, previously agreed upon, should rise and advocate the formation of the club or society required for the purpose set forth in the call, and end by moving the appointment of a committee to draft a constitution and by-laws. This committee should be instructed to report at the next meeting. A convenient time of adjournment is fixed on, and if there be no further business the meeting adjourns.

When the time for the second meeting arrives, the same officers continue, without any new motion. If either be absent, his place is supplied, on motion, by some other. The committee on the constitution and by-laws reports. If the constitution is not acceptable, those present suggest amendments. As soon as it has taken the required shape, it is adopted and signed by those present. The by-laws are treated in the same way.

The society is now formed, but not fully organized. The officers provided for by the constitution have now to be elected. This may be done at that meeting, or the society may be adjourned over for that purpose. So soon as it has been done, the chairman of the meeting gives way to the newly elected president, or, in his absence, to a vice-president; the secretary of the meeting vacates his seat, which is taken by the newly elected secretary or secretaries, and thus the organization of the new body is complete.

FORMS OF CONSTITUTIONS

A constitution is the formal written agreement making the fundamental law which binds the parties who associate. In preparation of this, useless words should be avoided.

The constitution, after having been adopted, should be engrossed in a blank book, and signed by the members. Amendments

or alterations should be entered in the same book, with the date of their adoption, in the shape of a copy from the minutes; and a side-note inserted in the margin of the constitution, opposite the article amended, showing on what page the amendment may be found.

LYCEUMS OR INSTITUTES

PREAMBLE. — Whereas, experience has shown that knowledge can be more readily acquired by combination of effort than singly, we, whose names are hereunto annexed, have agreed to form an association to be known as [*here insert title*], and for its better government, do hereby establish the following constitution:

ARTICLE I.—The name, style, and title of this association shall be [*here insert name*], and its object shall be the increase and the diffusion of knowledge among its members.

ARTICLE II.—1. The officers of this association shall consist of a president, two vice-presidents, a corresponding secretary, a recording secretary, a treasurer, a librarian, and a curator, who shall be elected annually on [*here insert time of election and mode—i.e., whether by open voice or by ballot*].

2. The said officers shall hold their offices until their successors shall have been elected, and their powers and duties shall be similar to those of like officers in like associations.

ARTICLE III.—There shall be appointed by the president, immediately after his election, by and with the consent of the association, the following standing committees, to consist of five members each, namely: on finance, library, museum, lectures, and printing, who shall perform such duties and take charge of such business as may be assigned to them by vote of the association.

ARTICLE IV.—1. Any person residing within [*here state limits*], who is above the age of twenty-one years, may become a resident member of this association, by consent of a majority of the members present at any stated meeting succeeding the one at which his name shall have been proposed; any person residing without the limits aforesaid may be chosen, in like manner, a corresponding member; and any person who is eminent in science or literature may be elected an honorary member.

2. Each and every resident member, upon his election, shall sign this constitution, and pay over to the recording secretary the sum of [*here insert the sum*], and shall pay the like sum annually in advance; but no dues or contributions shall be demanded of corresponding or honorary members.

ARTICLE V.—1. This association shall be divided into the following sections, namely: (1) Natural Science; (2) Arts; (3) History; (4) Agriculture and Horticulture; (5) Mental and Moral Philosophy; (6) General Literature; to each of which sections shall be referred all papers or business appropriate to its department; and to one or more of these sections each member, immediately after his election, shall attach himself.

2. Each section shall report, from time to time, upon the business intrusted to it, as this association shall direct.

ARTICLE VI.—This association shall meet monthly [*here insert time*], and at such other times as it may be called upon by the president, upon the written request of six members; of each of which meetings due notice shall be given, and at each and all of these meetings six members shall constitute a quorum for the transaction of business.

ARTICLE VII.—The rules of order embraced in "The Rules of Debate" shall govern the deliberations of this association so far as the same may apply; and the order of business therein laid down shall be followed, unless suspended or transposed by a two-thirds vote.

ARTICLE VIII.—Any member who shall be guilty of any public, felonious offence against the law, or who shall persevere in a course of conduct degrading of itself or calculated to bring this association into odium, may be expelled by a two-thirds vote of the members present at any stated meeting, and any member who shall neglect or refuse to pay his dues for more than one year shall thereby cease to be a member of this association; but no member shall be expelled until due notice shall have been given him of the charges brought against him, and until he shall have had the opportunity of being confronted with his accusers, and of being heard in his own defence.

ARTICLE IX.—This constitution may be altered, amended, or abrogated at any stated meeting, by a vote of two-thirds of the members present; *provided*, that written notice of said alteration, amendment, or abrogation shall have been given at a previous stated meeting.

DUTIES OF OFFICERS

THE PRESIDING OFFICER

The chairman should have made himself fully acquainted with the rules of order and the usages of deliberative bodies. He should be prompt, dignified, and impartial. He should be quick of eye to note any member who rises, and quick of speech to declare him in possession of the floor. He should suffer no member to violate order without instant rebuke. His voice should be steady, distinct, and clear, so that all may hear readily. When he puts the question, states a point of order, or otherwise addresses the body, he should rise, and when he has finished resume his seat. His constant attention is necessary, and his eye should never wander from the speaker before him; nor should he, in any way, show a neglect of the business. No matter what disturbance may arise, his coolness and temper must be preserved. If his decision be appealed from, he should show no resentment—an appeal being a matter of privilege—but should put the appeal in the same indifferent manner as though it were an ordinary question. He should always remember that he has been placed there to guide and control the machinery of the moment, and not to give his own views, or display his own abilities in an organized association. He will sign all orders for the payment of money ordered by the body.

THE RECORDING OFFICER

The secretary or clerk, at the commencement of proceedings, will seat himself at his table, and, at the order of the chairman, will read the minutes of the previous meeting. He must note down the proceedings, and write them down in full, previous to another meeting. He must file all resolutions and other papers before the body, and allow none to go from his custody without due authority. He must read all resolutions and papers when requested to do so by the chair. He must turn over his records and papers in good order to his successor on leaving his office. He must countersign all orders on the treasurer, which have been signed by the president, as this counter-signature is the evidence that the society has approved the order.

THE TREASURER

The treasurer must enter, in a book to be provided for the purpose, all money received, and all payments made, on account of the body. He must pay out no money, except on an order signed by the president and countersigned by the secretary. He must retain these orders as his vouchers. He must turn over his books, in good order, to his successor on leaving his office. He must give bonds in such needful sum as it deems best if the body require.

THE LIBRARIAN

The librarian will take upon him the charge of the books and manuscripts not pertaining to the duties of other officers. Of these he must keep a catalogue. He must keep a record of all books borrowed, by whom and when returned, and must only loan them under such regulations as the body see fit to adopt. He must turn over his catalogue and records to his successor on leaving his office.

THE CURATORS

The curators will take charge of all specimens of nature or art, or otherwise, and all property of the body not in charge of other officers. This they will have catalogued, and will keep it under such restrictions as may be imposed on them by the main body. They must turn over their catalogue, papers, and property to their successors on leaving their office.

THE COMMITTEE ON CORRESPONDENCE

The committee will take charge of all correspondence ordered by the body, and if there be no corresponding secretary will conduct it with all parties, at direction of the body, through its chairman. It will report, from time to time, as directed, and will keep copies of letters sent, and a file of those received, which it will turn over to its successors on its discharge. If there be a corresponding secretary, he will perform the duties assigned above to the committee of correspondence.

THE COMMITTEE ON FINANCE

The committee on finance will devise the ways and means to obtain the necessary funds for the body, and report thereon from time to time, and will attend to such other duties as may be assigned to them.

OTHER COMMITTEES

Other committees will attend to such business as may be assigned to them by the main body, reporting thereon as may be required.

BY-LAWS

The old custom of appending a distinct set of by-laws has fallen into disuse. The main points will be found embodied in the constitution in the forms given. Any others, or any modifications of the rules necessary, may be provided for in the constitution, or enacted by a majority vote. But, if it be thought necessary, that portion of the constitution that contains provisions that were formerly so placed can be made distinct.

RULES OF DEBATE

THE PRESIDENT

On taking his seat, says:

"The meeting [*or society, or club, or association, as the case may be*] will come to order."

If there has been a meeting previous:

"The secretary will please to read the minutes."

After the minutes have been read:

"You have heard the minutes of the previous meeting read. What order do you take on them?"

When a motion has been made and seconded:

"It has been moved and seconded that [*here state the motion*]. Are you ready for the question?"

If a member arises to speak, recognize him by naming him by his place, or in any way which will identify him without using his name, if possible.

In putting the question:

"It has been moved and seconded that [*here state the motion*]. So many as are in favor of the motion will signify their assent by saying 'Aye!'"

When the ayes have voted, say:

"Those to the contrary opinion, 'No!'"

Or, have the resolution read, and say:

"It has been moved and seconded that the resolution just read be passed. So many as are in favor," etc.

On a call for the previous question:

"Shall the main question be now put? Those in the affirmative will," etc.

On an appeal, state the decision, and, if you think proper, the reasons therefor, and that it has been appealed from, and then:

"Shall the decision of the chair stand? Those in the affirmative," etc.

Should it be sustained, say:

"The ayes have it. The decision of the chair stands as the judgment of this meeting" [*or society, etc., as the case may be*].

Should it not be sustained, say:

"The noes have it. The decision of the chair is reversed."

In announcing the result of a question, if it be carried, say:

"The ayes appear to have it—the ayes have it—the motion [*or amendment, as the case may be*] is carried."

If it be lost:

"The noes appear to have it—the noes have it—the motion is lost."

If a division be called for:

"A division is called for. Those in favor of the motion will rise."

Count them. When counted, announce the number, and say:

"Those opposed will rise."

Count them, report the number, and declare the result.

If the yeas and nays be called for, and no objection be made, he states the question, if needed, and says:

"As the roll is called, members will vote in the affirmative or negative. The secretary will call the roll."

After the ayes and nays have been determined, the chairman states the number and declares the result.

If no quorum be present at the hour of meeting, after waiting a reasonable time, he says:

"The hour for which this meeting was called having arrived and passed, and no quorum being present, what order is to be taken?"

Or, he may simply announce the fact, and wait for a member to move an adjournment.

If during a meeting some member calls for a count, he counts, and announces if a quorum be present or not. If not, he says:

"This meeting is in want of a quorum. What order is to be taken?"

Or he may state the fact only, and wait for a motion to adjourn. But while there is no quorum present, business must be suspended.

After the minutes have been adopted, he says:

"The next business in order is the reports of standing committees."

If none, or after they have reported, he says:

"The reports of special committees are next in order."

And so he announces each business in its proper succession.

When the hour for the orders of the day arrives, on call of a member, he says:

"Shall the orders of the day be taken up? So many as are in favor," etc.

In case of disorder in committee of the whole, which its chairman can not repress, the presiding officer may say:

"The committee of the whole is dissolved. The society [*or club, or association, as the case may be*] will come to order. Members will take their seats."

He will then take the chair, instead of the chairman of the committee of the whole.

In taking the question on amendment, he says:

"The question will be on the amendment offered by the member from" [*naming his place, or otherwise indicating him*], and then puts the question.

If on an amendment to an amendment, then:

"The question will be on the amendment to the amendment," and the rest as before.

If either the amendment or the amendment to the amendment be carried, he will say:

"The question now recurs on the resolution as amended. Are you ready for the question?"

And if no member rises to speak, he will put the question.

On the motion to amend by striking out words from a resolution, he says:

"It is moved to amend by striking out the words [*naming them*]. Shall those words stand?" And then he puts the question.

Objection being made to the reading of a paper, he will say:

"Shall the paper [*naming it*] be read?" and then put the question.

And on an objection being made to the reception of a report, he will say:

"Shall the report of the committee be received?" and after the demand he puts the question.

When in doubt as to which member was up first, he says:

"The chair is in doubt as to which member is entitled to the floor. The society [*or club, or association, as the case may be*] will decide. Was the gentleman from —— [*indicating any one*] first up?" And puts the question. If the body decide against that member, he puts the question on the next, and so through, until the society decides that some one of them has the floor. If but two contend, however, and the society decide against the first named, the decision virtually entitles the other to the floor without further vote.

If a member is out of order, he will say:

"The member [*indicating him*] is out of order." He will make him take his seat, and then state wherein the member is out of order.

If the point of order is raised by a member, he will say:

"The member [*indicating him*] will state his point of order." When this has been done, he decides the point.

On a question of the time of adjournment, he says:

"It has been moved and seconded that when this meeting [*or club, etc., as the case may be*] adjourns, it adjourn to [*naming time and place*]. Are you ready for the question?" And if no one rises to speak, puts the question.

On a question of adjournment, he says:

"It has been moved and seconded that this meeting [*or club, etc.*] do now adjourn;" and puts the question.

When adjournment is carried, he says:

"This society [*or club, etc.*] stands adjourned to" [*naming time and place*]; or if without any time, he says:

"This society [*or club, etc.*] stands adjourned without day."

THE RECORDING SECRETARY

The secretary commences his minutes thus:

"At a stated [*or special, or adjourned stated, or adjourned special, as the case may be*] meeting of [*here insert the name of the body*], held on [*here insert the time and place of meeting*], Mr. [*insert chairman's name*] in the chair, and [*here insert secretary's name*] acting as secretary—

"The minutes of the preceding meeting were read and approved."

If the reading of the minutes was dispensed with, say so, instead of the preceding line.

Then give a statement of what was done, without comments, as succinctly as possible, down to the adjournment.

In countersigning an order for money, or in giving a certified copy of the minutes, or an extract from them, always sign the name on the left-hand corner of each sheet except the last. On the last, the signature on the same corner should be preceded—if an order for money—by the word *teste* or *attest;* and if it be a copy of minutes, by the words "A true copy of the minutes."

In case of an adjournment for want of a quorum, say:

"At a stated [*or special, etc.*] meeting called at [*name place and time*], no quorum being present, the meeting adjourned."

In recording the yeas and nays, prepare a list of the members, or have it on hand, and after the name of each have two columns ruled.

Where a member votes "aye," write it in the first column, or head one column "aye," and the other "no," and make a mark in the proper column, opposite the name. Where he votes "no," write it on the second. Add up, and enter the number at the foot of each column. Indorse the resolution or motion voted upon the back of the list.

Where a report is made, it is not necessary in the minutes to do more than give an abstract of its contents, or a sentence or two indicating its nature. The report should, however, be indorsed with its title and the date of its report and filed.

A list of the orders of the day should always be made out previous to every meeting, for the convenience of the presiding officer.

CORRESPONDING SECRETARY

In addressing a letter for the body, write the words "Corresponding Secretary," as concluding part of the signature, and retain a copy of the letter sent, with a record of the time it was despatched, stating whether by mail or private hand.

THE TREASURER

The form of account of the treasurer is very simple. But where the accounts are complicated, a regular set of books should be opened, and kept by double entry.

THE COMMITTEES

The chairman of the committee of the whole, when the committee has risen, will say to the president of the main body, if it have concluded its business:

"Mr. President: The committee of the whole has, according to order, gone through the business assigned to it, and asks leave to report."

Leave being granted, he reports what has been done.

Or, not having concluded—

"The committee of the whole has, according to order, considered the business assigned to it, and made progress therein, but not having time to conclude the same, asks leave to sit again."

Or, if rising from the want of a quorum—

"The committee of the whole has, according to order, considered [*proceeded to consider*] the business assigned to it, but has risen for want of a quorum."

In putting the question for rising—

"It has been moved and seconded that this committee do now rise and report [*or report progress*]. So many as are in favor," etc.

All written reports are headed after a similar form. If from a standing committee, thus:

"The committee on [*insert name of committee*] respectfully report ——." And then let the report follow.

If a special committee—

The committee to which was referred [*here state the special matter of reference*] have considered the same, and respectfully report," etc.

And all reports conclude with:

"All of which is respectfully submitted."

A minority report is headed:

"The undersigned, the minority of a committee to which was referred," etc.

And concludes as in a majority report.

RULES OF ORDER

QUORUM

1. A quorum is a sufficient number to legally transact business. A majority of the members of any association constitutes a natural quorum; but a smaller number is usually made a quorum by a provision to that effect in the constitution or by-laws, through motives of convenience.

2. If there be a quorum present at the hour named for the meeting, or within thirty minutes thereafter, the presiding officer takes the chair, and calls the association to order; if not, he waits a reasonable time, and from the chair announces that no quorum is present. Thereupon no further business is in order, except to adjourn for want of a quorum. But it will be in order to call the roll of members, and to make endeavor to obtain the presence of enough to form a quorum.

3. During the transaction of business, should it be observed that no quorum is present, the chair may announce the fact, or any member may call for a count. If, on counting, it be found that there is no quorum, business is suspended until a quorum be found. If not to be had, the meeting must be adjourned.

4. If, on calling the ayes and noes, or on division, a quorum be not found, the vote is null, and at the next meeting the unfinished business is in the exact state it was when the absence of a quorum was discovered.

CALL

1. On a call of the body, each member rises as he is called and answers to his name, and the absentees are noted. In a small body it is not necessary to rise.

MINUTES

1. The presiding officer having taken the chair, and a quorum being present, the minutes are read. If there be any mistakes in the record, these are amended, and then the minutes are adopted. If, under any circumstances requiring haste, or in the absence of the journal, the reading of the minutes be suspended, they may be either read and adopted at another stage of the proceedings, or at the next succeeding meeting. Nevertheless, the minutes being a record of facts, any error subsequently discovered may be amended at any time. This may be done by unanimous consent; or, if objections be made, then any member who voted in the affirmative on their adoption can move a reconsideration of the motion to adopt. This last motion prevailing, the minutes are open to amendment; and after being amended, the motion on their adoption as amended is put.

2. The rule of record in ordinary associations is somewhat different from that in legislative bodies. The minutes of the former stand in lieu of the journals of the latter. The former never contain a question which is interrupted by a vote to adjourn or to proceed to the order of the day; the latter always do. Even propositions withdrawn, or ruled out of order, may be entered as so treated. The minutes are to be full and explicit, and a true record of all that was done, but not of all that was said, unless the latter be necessary to the clear understanding of the business.

3. Proceedings in committee of the whole are, of course, not entered on the minutes—the entry merely that the committee rose and reported thus, and so, and what was done thereon by the association.

PRESIDING OFFICER

In the absence of the president, or in case he declines, the vice-president takes the chair. If there be more than one vice-president, then they take it in their numerical order, unless the association, by vote, designate a particular one. If neither president nor vice-president be present, some member is called to act temporarily as chairman, on motion put by the mover thereof.

RECORDING OFFICER

In the absence of the secretary, or, if more than one, in the absence of all, a temporary secretary must be appointed on motion.

ARRANGEMENT OF BUSINESS

This, in associations, is usually provided for in the by-laws. If not otherwise provided for, it is as follows: 1. Reading the minutes; 2. Reports of standing committees; 3. Reports of special committees; 4. Special orders; 5. Unfinished business; 6. New business. The election of new members, unless otherwise ordered, is always in order; and the election of officers ranks as a special order; but an election of members is not in order while other business is pending, or while a member has the floor.

ORDERS

There is only one case where a member has a right to insist on anything, and that is where he calls for the execution of an existing order. No debate or delay can be had on it; but where it is for an order of the day, fixing some particular business to be taken up, then the president, on call of a member, puts the question whether the association will proceed to the order of the day. If it is decided in the negative, that is, in effect, a reversal of the former order, and the association decides to proceed to other business.

COMMITTEES

1. Standing committees are appointed under the constitution or by-laws of the association, or by resolution, and sit permanently, while special committees are usually appointed by resolution to attend to some particular business, which being done, they are usually discharged.

2. The first-named person acts as chairman of any committee. It is true that the committee possesses the inherent power to choose its own chairman; but custom prevents this power from being used. Should a committee select some other than the first named person as chairman, it would be considered a wanton insult.

3. It is always proper to place the mover of a successful motion on any committee arising through his resolution, and to name him first; but if the committee is upon an inquiry into his conduct, or where its deliberations concern himself personally, or his manifest interest, the rule is not followed.

4. As near as they will apply, the rules of order of the main body govern the deliberations of committees.

5. A committee to whom a resolution or affirmative proposition is committed should always have a majority of members, if they can be had, favorable to such resolution or proposition.

6. Unless otherwise ordered, the chair appoints all committees.

7. When there is a standing committee on any subject, anything referring to such subject should be referred to that committee alone; but it may be given to a special committee, if the association think proper.

8. Standing committees require no order to report. They are always in session, and should report at every meeting, if only to report progress.

9. A committee can not sit while the main body is in session, unless so ordered to do.

10. A majority of a committee must concur in a report; but the minority are never refused leave to bring in a counter report.

11. Sometimes a majority can not be found,

when the committee should report the fact of their disagreement, and ask leave to be discharged; they are then to be discharged, and either a new committee raised, or the subject brought before a committee of the whole, or before the main body.

12. Persons appointed upon a committee should join that committee so soon as they are notified of their appointment, unless they are excused; as it is the duty of the first-named member of the committee to call his fellows together as soon as possible.

COMMITTEE OF THE WHOLE

1. If it be necessary to go into committee of the whole society, either for a general or specific purpose, it is done by motion, when the chairman vacates the chair, and calls some member to it to act as chairman; though the committee of the whole, if it chooses, can select another chairman like any other committee. This it never does.

The quorum of the committee is the same as that of the main body. If a quorum be found wanting, the committee has to rise, the regular chairman takes his seat, and the chairman of the committee informs him that the committee rises for want of a quorum. Then the usual course is taken in regard to the absence of a quorum.

2. If any communication be made to the main body while in committee of the whole, the committee can not receive it. If its reception be necessary, the committee have to rise.

3. If there be confusion or disturbance in committee of the whole, the president may take the chair, declare the committee dissolved, and reduce the body to order. In that case it requires another motion for that committee to sit again.

4. A committee of the whole can not adjourn, but it must rise. It can not take the previous question, nor take the ayes and noes.

5. If the business before the committee of the whole be unfinished, it rises on motion, the regular presiding officer takes the chair, and the chairman of the committee reports that the committee of the whole have, according to order, considered the business assigned to them, and have made progress therein, but, not having time to conclude the same, ask leave to sit again. Leave is then granted on motion. If the subject be a special one, and it is concluded, the motion is that the committee rise and report proceedings; then, when the president takes the chair, the chairman of the committee reports that the committee have gone though the business referred to them, and ask leave to report. Leave is then given to report, or at some other time, either by motion, or, should there be no objection, on the call of some member.

6. In committee, members may speak oftener than once on the same subject, and are not confined strictly to the subject-matter. With these and the foregoing exceptions, the same rules of order govern the committee of the whole as govern the main body.

7. A motion to rise and report progress is in order at any stage of the business, and is to be decided without debate. When they have reported, they may be discharged on motion, which brings the matter laid before them directly before the association itself.

COMMITMENT

1. If it be desired to refer a resolution, address, or other matter to a committee, it is done on motion. If to a special committee, the chair names the committee. Any member present may suggest one member on that committee, and if the main body do not object, the chair will name him, since the silence of members in that case is equivalent to a direct appointment of that person by the association. But such a course is unusual, and generally improper.

2. Though the majority on a committee should be favorable to a measure, the minority may be of those who are opposed to it in some particulars. But those totally opposed to it should never be appointed; and if any one of that view be named, he should rise and state the fact, when the main body will excuse him from serving.

3. If it be a written matter which is referred, the secretary delivers it to the first named of the committee.

4. A committee meets when and where it pleases, unless the time and place is fixed for it. But it can not act unless its members assemble together.

5. The committee can not change the title or subject of the matter before it, but otherwise have full power over it.

6. If it be a written matter before it, if it originate with the committee, the writing must be considered paragraph by paragraph, and the question put on each. After each paragraph is approved or amended, it is then considered as a whole. If it has been referred, the committee only report the amendments they recommend separately; as they have no right to amend a paper belonging to the main body.

7. When the committee is through, some member moves that it rise and report the matter to the main body, with or without amendments, as the case may be.

REPORTS OF COMMITTEES

The chairman of the committee, standing in his place, informs the association that the committee to which was intrusted such a matter, naming it, have directed him to report thereon, and moves that the report be received. The cry of "Receive!" or "Report!" or "Read it!" from any one, generally dispenses with the formality of a question. He then reads the report, whatever it may be, and delivers the written report to the secretary. Then it lies on the table until called up by a motion. The committee is dissolved, and can act no more unless reconstituted for the purpose by a vote.

MOTIONS

1. A motion is a proposition by two members; consequently, if not seconded, it is not to be entertained. This is different, however, in the case of an appeal, where the question may be put on the demand of one member.

2. A motion must be put in writing, if any member desires it, and read, when required for information. But if the demand for the reading be repeated, so as to show itself a mere pretext for delay, the association may order it to be read no more.

3. A motion for adjournment can not be made while one member is speaking; because it is a breach of order for one to speak when another has the floor, except to a point of order; consequently, even a privileged motion can not be entertained. And even on a call to order, decided against him, he must still be allowed to go on, provided he does not persist in the same violation of order in his remarks.

AMENDMENTS

1. An amendment takes the place of the ques-

tion it is proposed to amend, and must be decided first. So an amendment to an amendment must be decided before the first amendment.

2. But amendments can not be piled one on the other; that is, while you can amend an amendment, you can not amend the second amendment.

3. For example: it is moved to give the thanks of the association for his kind gift of fifty volumes to the society. It is moved to amend by striking out the word "kind" and inserting "generous." This is an amendment. It is then moved to strike out the word "generous" and insert that of "liberal." This is an amendment to the amendment. It is then proposed to strike out the word "liberal" and insert that of "munificent." This third amendment is out of order.

4. Nor can amendments be made to certain privileged questions. Thus, an amendment to a motion to adjourn, for the previous question, a call of the house, or to lay on the table.

5. But an amendment, though inconsistent with one previously adopted, is still in order. It is for the association alone to decide whether, by the passage of the second amendment, it will recede from its former action.

6. On an amendment being moved, a member who has spoken to the main question may speak to the amendment.

7. If it be proposed to amend by leaving out certain words, it may be moved to amend the amendment by leaving out a part of the words of the amendment, which is equivalent to letting those words remain.

8. For example: the original words being "Resolved that we have heard with feelings of lively satisfaction that the authorities of our town propose to tax dogs, and approve their action," it is moved to amend by striking out the words "with feelings of lively satisfaction." If it be moved to amend the amendment, by striking out the words "with feelings of satisfaction," the question would be: Shall those words stand as part of the resolution? If carried, the word "lively"' is struck out, and the rest remains. The question then recurs on the resolution as amended.

9. When it is proposed to amend by inserting a paragraph, or part of one, the friends of this should make it perfect by amendments; because if it be inserted it can not be amended, since it has been agreed to in that form. So if proposed to amend by striking out a paragraph, the friends of the paragraph should also make it as perfect, by amendments, as possible; for if the striking out be negatived, that is equivalent to agreeing to it in that form, and amendments are not admissible.

10. When it is moved to amend by striking out certain words and inserting others, the manner of stating the question is, first to read the whole passage to be amended, as it stands at present; then the words proposed to be struck out; next those to be inserted; and, lastly, the whole passage as it will be when amended. And the question, if desired, is then to be divided, and put first on striking out. If carried, it is next on inserting the words proposed. If that be lost, it may be moved to insert others.

11. A motion is made to amend by striking out certain words and inserting others in their place, which is negatived. Then it is moved to strike out the same words, and to insert others of a tenor entirely different from those first proposed, which is negatived. Then it is moved to strike out the same words and insert nothing, which is agreed to. All this is in order; because to strike out A and insert B is one proposition. To strike out A and insert C is another proposition. To strike out A and insert nothing is another proposition. The rejection of either proposition does not preclude the offering of a new one. But a motion to strike out alone being voted down, is equivalent to voting that the words should stand, and amendments are not in order. Jefferson thinks that even if the question be divided, and taken first on the striking out, and that fails, amendments are in order, because the proposition is only half put. There is force in this, and it seems to be the practice.

12. After the paragraph is amended, it nevertheless may be further amended by striking it entirely out.

PRIVILEGED QUESTIONS

1. "When a question is under debate, no motion shall be received but to adjourn, to lay on the table, to postpone indefinitely, to postpone to a day certain, to commit, or to amend; which several motions shall have precedence in the order they stand arranged; and the motion to adjourn shall be always in order, and shall be decided without debate."

2. These privileged questions shall not only be entertained while the main question is pending, but will be put before it.

3. A motion to adjourn takes precedence of all others, because otherwise the body might be kept sitting against its will, and indefinitely. Yet even this question can not be entertained after another question is actually put, and while members are voting upon it.

4. An order of the day—that is, a question which has previously been set down to be argued or determined on that day—takes place of all questions except adjournment. If, for instance, a matter be set down for 7 o'clock, then at that hour, although another question may be before the body, a motion to proceed to take up the order of the day must be received by the chair.

5. These privileged questions sometimes conflict with each other, but are reconciled under known rules.

6. If the previous question be first moved, it is first put. This cuts off all the others. The society, having decided to take up the question, must vote on it as it stands—postponement, commitment, and amendment being out of order.

7. If postponement be carried, of course the question can not be either committed, amended, nor the previous question be carried, for the subject is not before the body.

8. If committed, the same rules and reasons follow.

9. If amendment is first moved, the question on that must be determined before the previous question.

10. If amendment and postponement are proposed, the latter is put first. The reason is, that the amendment is not suppressed, but comes up again in its order whenever the main question is again considered.

11. If a motion for amendment be followed by one for commitment, the latter shall be put first.

12. The previous question can not be put on the motion to postpone, commit, or amend the main question.

13. The motion for the previous question, or for commitment or amendment, can not be postponed.

14. A motion made for reading papers relative to the question discussed must be put before the main question.

15. A motion made and seconded can not be withdrawn without leave, though, if no member object, it is not necessary to put the question.

16. When different sums or dates are used in filling blanks, the question shall first be put on the largest sum and the longest time.

17. In commitment, the motions to commit are privileged in the following order: 1. Committee of the Whole; 2. Standing Committee; 3. Special Committee.

18. A motion to lay on the table must be put before either postponement, commitment, or amendment, although neither of these last can be laid on the table.

19. A postponement can be amended as to time, and an amendment can be amended; but if it be proposed to amend by inserting anything, a motion to amend or perfect the matter proposed to be inserted must be put to a vote before the question to insert. The same rule follows in regard to striking out.

20. A question of privilege, such as a quarrel between members, or affecting the character of members, or the main body, must be disposed of before the original question be disposed of.

21. Questions on leave to withdraw motions, or appeals from the decision of the chair, have a precedence over the main question.

PREVIOUS QUESTION

1. When any question is before the association, any member may move that the main question be put; and this is termed moving the previous question. If the motion pass in the affirmative, the main question is put immediately, and no further debate is allowed upon the matter at issue.

2. This is frequently styled "the gag law," because its adoption cuts off all debate. When a subject in the judgment of the majority has been exhausted, or when personalities have been introduced, and disorders are threatened, it is a very proper and wise thing; but it should not generally be brought to bear so long as members who desire to speak are unheard.

DIVISION OF THE QUESTION

1. A question which contains more parts than one may be divided, on the demand of a member, provided the main body concur. If the question contain parts which are evidently incompatible, the presiding officer may divide them of his own will, unless the body deny him the power.

2. When a question is divided, after the question has been taken on the first member of it, the second member is still open to amendment and debate, unless the previous question be taken upon it.

COEXISTING QUESTIONS

1. Occasionally there are two questions up at the same time—one primarily and the other secondarily. Are both subject to debate?

2. When it has been moved to commit a question, the main question is debatable under that motion; but no amendment can be entertained, because the question of commitment will be first put.

EQUIVALENT QUESTIONS

Where questions are equivalent, so that the rejection of one is the affirming the other, that necessarily determines the latter. Thus, a vote against striking out is virtually the same as a vote to agree; a vote to reject is equivalent to a vote to adopt; but, on a motion to strike out A and insert B being decided in the negative, this does not preclude the motion to strike out A and insert C, these being separate questions.

THE QUESTION

1. The question is first to be put on the affirmative and then on the negative side.

2. After the question has been put, debate upon it is out of order; but after the presiding officer has put the affirmative, any member who has not spoken before on the question may speak before the negative be put, for it is not a full question until the negative be put.

3. But on trifling matters, such as leave to bring in reports of committees, withdrawing motions, reading papers, and such like, the consent of the main body will be supposed without the formality of a question, unless some one should object, for the absence of an objection in such cases testifies to unanimous consent.

DIVISION

1. The affirmative and negative voices having been heard upon a question, the presiding officer declares by the sound what is the result. If he have doubts as to the relative strength of the yeas and nays, or if any member demands it, before other business has been gone into, then a division is ordered.

2. The mode of dividing is for those in the affirmative to rise, when the presiding officer counts those up, and announces the number. These sit, and those in the negative arise, to be counted in like manner.

3. One-fifth of the members present may call for the yeas and nays, each member's name being called, and the answer entered by the secretary.

In case of any disorder during a division or calling of the yeas and nays, the presiding officer decides the question of order; and the decision is not the subject of appeal at this time, although it may be revised after the division or call is over.

RECONSIDERATION

1. A question which has been decided either in the affirmative or in the negative may be reconsidered upon the motion of a member who has voted with the majority. But this motion for reconsideration will not be in order, unless made during the meeting whereat the question was decided.

2. The effect of the adoption of a motion to reconsider is to place the question in the position it occupied before the vote on its adoption or rejection was taken; consequently it is as open to amendment, postponement, commitment, or laying on the table as it was at that time.

APPEALS

1. An appeal from the decision of the chair is a matter of right, and brings under review and opens to debate the grounds of such decision.

2. The presiding officer, by usage and courtesy, has the right to assign his reasons for his decision before the question is put on the appeal.

3. The question on an appeal is, whether the decision of the presiding officer shall stand as the judgment of the body itself. If a majority vote in the affirmative, the decision stands; if not, it is reversed.

4. An appeal can not be put on an appeal; that is, a second appeal can not be entertained while the first remains undisposed of.

5. A mere opinion of the chair, drawn out by an interrogation on points of order, is not subject to an appeal. To be appealed from, it must be an actual decision on a question coming up legitimately in the progress of business.

PAPERS

1. When papers have been laid before the main body, or referred to a committee, every member has a right to hear them once read at the secretary's table before he can be compelled to vote on them.

2. But he has not a right, therefore, to have papers read independently of the will of a majority of his colleagues. If the reading be demanded purely for information, and not for delay, and no one objects, the chairman will direct it to be done, without putting it to the question. But should any one object, the question must be put.

3. Nor can any member have a right, without a question first put, to have anything read which is not before the body.

4. Nor can a member have a right to read a paper, in his place, not even his own speech, if it be objected to, without the leave of the body. But this rule is not usually enforced, unless there be a gross or intentional abuse of the time and patience of the body.

COMMUNICATIONS

When a communication addressed to the main body is presented, the question is to be put whether it shall be received. But a general cry of "Receive!" or, even if there be no objection, the silence of the body is sufficient to dispense with the formality of the question. In that case, or in case the vote on its reception be in the affirmative, it is to be read, unless otherwise disposed of.

THINGS ON THE TABLE

1. Matters which have been laid on the table can only be called up when the class of business to which they belong is in order.

2. If laid on the table by a motion, they can only be lifted from it by a motion. If laid there under rules, as a matter of course, they can be called up by any member as a matter of right, when the business to which they belong is reached in its regular order.

3. But it is deemed discourteous, when the matter lies on the table, to call it up in the absence of the mover, or against his wishes, if present, provided it refers to a matter of local or private concern in the mover's special charge; and provided, further, that it is not designed or calculated to delay final action on any measure or proposition before the body, or impede the progress of business.

RESOLUTIONS

All resolutions must be committed to writing, if demanded, and the name of the mover should be signed thereto.

RIGHTS OF MEMBERS

1. It is the right of a member to have the question put on his motion, and a refusal to do this is a breach of order on the part of the chair.

2. It is the right of a member to insist on the execution of a standing order of the body.

3. And it is the right of a member, if he observe that a quorum is not present during the transaction of business, to call for a count.

ORDER AND DECORUM

1. When the presiding officer takes the chair every member is to be seated.

2. When any member means to speak, he is to stand up, uncovered, and to address himself—not to those around, or to any particular member—but to the presiding officer, who calls him by his name; or, better still, indicates him by his position, or otherwise, that the body may take notice who it is that speaks. But a member who is indisposed may be indulged to speak sitting.

3. When a member stands up to speak, no question is to be put; but he is to be heard, unless the body overrules him.

4. If two or more rise to speak nearly together, the chairman decides who was first up, and calls him by name or location; whereupon he proceeds, unless he voluntarily sits down and gives way to the other. But if the chairman is not clear in his mind, or the body does not acquiesce in his decision, the question is to be put as to which was first up.

5. No man can speak more than once to the same question, not even though he change his opinion in the meanwhile, unless by unanimous consent.

6. But if he be the mover, proposer, or introducer of the question pending, he may close the debate; but only after every one desiring to speak on it shall have been heard.

7. Or he may be permitted to speak again, to clear a matter of fact; or merely to explain himself in some material part of his speech; or to the manner and words of the question, keeping himself to that only, and not traveling into the merits of it; or to the orders of the body, if they be transgressed, keeping within that line.

8. If the chairman rise to state a point of order, give information, or otherwise speak within his privilege, the member standing up must resume his seat, that the chairman may be first heard.

9. No one is to speak impertinently or beside the question, superfluously or tediously.

10. No person is to use indecent language against the proceedings of the body; and no prior determination of which is to be reflected on by any member, unless he means to conclude with a motion to rescind it. While a proposition is under consideration, however, though it has been even reported by a committee, reflections upon it are not reflections upon the body itself.

11. No person, in speaking, is to mention a member then present by his name; but to describe him by his seat, or as one who spoke last; or on the other side of the question; or in some other indirect way to identify him.

12. Nor is he to digress from the matter to fall upon the person; nor to use even unmanly words against a member; nor to arraign the motives of those who propose or advocate it. All such violations of order it is the duty of the chair to immediately suppress.

13. When a member shall be called to order by a member or the chair, he shall sit down until the point of order is decided. The member who makes the call shall state his point of order, and the question shall be decided by the chair, without debate; subject, of course, to an appeal.

14. While the chair is putting a question, or addressing the body, none shall walk out of or across the room; nor, in such case, nor while a member is speaking, shall entertain private discourse; nor, while a member is speaking, shall

pass between him and the chair. Every member shall remain uncovered while the body is in session. No member, or other person, shall visit or remain near the secretary's table while the ayes and noes are being called, or the ballots counted.

15. No one is to disturb another in his speech by hissing, coughing, spitting, or rude exclamations; nor stand up to interrupt him; nor pass between the chair and the speaking member, nor go across the house while he is speaking; nor walk up and down the floor; nor take books or papers from the table, or write there. Nevertheless, if no attention is paid to what the member says, it is a piece of prudence for him to sit down, as the ill-manners of his colleagues are *prima facie* evidence that he is saying nothing worth the hearing.

16. If repeated calls do not produce order, the chair may call any member by name who obstinately persists in irregularity, whereupon the main body may require the member to sit down. He must be heard in exculpation, if it is intended to proceed further, and then withdraw to await the further action of his colleagues, who may pass a vote of censure upon him; or, if he persist, may act in his case in the manner prescribed in the by-laws of the body.

17. Disorderly words are not to be noted until the member finishes his speech, unless they are manifestly personal, indecent, blasphemous, or reflecting upon the house. The offensive words are to be taken down by the member who objects, or by the secretary, at his request. If the chair thinks they are not disorderly, he directs them not to be taken down by the secretary, unless there be a general cry to the contrary. They are to be read, when taken down, to the member, who may deny them; in which case the body shall decide by vote whether they are his or not. If they are voted to be his, or if he acknowledge them, he must justify them satisfactorily, explain the use of them, or apologize. If the offended member still persists, and is not satisfied, the sense of the body may be taken, during which both members must withdraw. But when business has intervened, or any member spoken after the offensive words, they can not be taken down.

18. Disorderly words spoken in committee must be written down, as in the main body; but the committee can only report them to the latter for its action.

19. Blasphemous or seditious words, or words reflecting on the religious belief of members or on religion generally, are not in order.

20. No member can be present when anything which concerns himself is debating, much less vote upon it; nor is any member to speak to the merit of it until he withdraws. Nevertheless, he may be heard upon it before he withdraws.

21. No member is to come into the place of meeting, or remain there, with his head covered, nor put on his hat while there.

22. A question of order may be adjourned for a time, to look into precedents.

23. When a member is called to order, he shall sit down at once, unless permitted to explain. If the body be appealed to, it shall decide the question without debate; if there be no appeal, the decision of the chair shall be submitted to. If the decision be in favor of the member, he shall be allowed to proceed; if against him, he shall not proceed without the leave of the body; and the body may, if it think proper, proceed to censure him.

24. All decisions of the presiding officer are liable to be reversed, altered, or amended by the body.

ADJOURNMENTS AND RECESSES

An adjournment is the closing of a session for the day to be resumed on another day; on which day the regular routine of business is commenced anew, except when superseded by a special order.

A recess is a suspension of business from one hour of a day to another hour of the same day; at which hour business is taken up at the point where it was left, unless a special order takes its place.

A motion to adjourn can not be amended by adding the day and hour. It must be put simply that this body do now adjourn; and, if carried in the affirmative, it is adjourned to the next sitting day, or without day, as the case may be. But any special time of adjournment may be fixed by a previous resolution.

If a question be put for adjournment, it is no adjournment till so pronounced by the chair. And it is a breach of courtesy for a member to leave his place until the chair has pronounced on the question of adjournment.

SUSPENSION OF RULES

By unanimous consent any rule or order may be suspended in part or whole; but the object of suspending the rule must be stated in the motion, and when that object has failed or been attained the rule regains its former force.

FORCE OF WORDS

Throughout these rules, whenever the word "body" or "main body" has been used, it means the society, club, association, or other organized body to which the rules are made to apply.

TIE VOTE

Where a presiding officer is not chosen out of the body itself, as in the case of the Vice-President of the United States, the Lieutenant-Governor of a State, or the Mayor of a city or town, who may preside over the Common Council, he has naturally no vote. The Constitution in the case of the first two, and the charter in case of the last, give them the privilege of deciding in case of a tie, and they do not vote otherwise.

But in the case of the Speaker of Congress, or of a House of Assembly, or a State Senate choosing its own presiding officer, the Speaker or President votes like any other member, only it is customary for the clerk, in calling the roll, to call him by his title, and not by his name. Hence in ordinary societies the presiding officer votes on all questions, and *must* vote if it be pressed, or be guilty of contempt of the main body, as in the case of any other member. The effect of a tie vote then is merely that the question before the body, not having a majority of votes, is lost.

OF RESOLUTIONS

A written resolution is the formal record of opinion upon one or more subjects, expressed by a body of men. As in almost every species of written composition, the language should be simple, terse, and forcible.

A resolution may or may not be prefaced by a preamble. If it be so constructed, the preamble should set forth briefly the cause of the reso-

lution which is to follow. This preamble is usually commenced with the word "Whereas."

After this comes the resolution or resolutions —which commence with the word "Resolved."

A good resolution—one that is pithy and forcible—requires some care in its composition. Unless the writer be a very experienced one, he had better avoid all figures of rhetoric, and confine himself to a plain statement of the opinion he wishes to convey.

As example is always useful, we will take a subject, and show the preferable form of a preamble and resolution upon it.

We will suppose that a party majority in the Legislature passes a registry law, which is not approved by the opposite party, and a public meeting of the members of the latter desire to condemn it. The following preamble and resolutions may be suggested:

"Whereas, It is proper for the people, in their public assemblages, to express their views of the conduct of those in office, and to award to the latter their approval or censure; and

"Whereas, The late Legislature of this State have passed an oppressive registry bill, odious in its principles, and burdensome in its details; therefore,

"Resolved, That the act referred to meets our unqualified disapproval and decided condemnation; that we will spare no efforts to promote its abrogation; and that we will vote for no candidate for Senate or Assembly who is not pledged to its speedy repeal."

Now, the above is not more wordy than such resolutions usually are, yet it can be easily simplified.

It is unnecessary to aver that it is proper for the people to express their views on official conduct "in their public assemblages," since it is their right to do that also in other places. The rest of the first paragraph is a mere repetition. And, finally, the whole is a matter generally admitted, and, therefore, not the subject of affirmation. The preamble had better begin with the second paragraph. But that contains useless words also. Anything which is oppressive is apt to be odious in its principles and burdensome in its details, and *vice versa.*

The resolution itself contains superfluous matter in its phrases—"decided condemnation" or "unqualified disapproval" should be stricken out, and the remainder of the paragraph condensed.

Again: the statements of the preamble may be as fully expressed in the body of the resolution itself, and may be properly omitted.

Following these hints, the resolution would read as follows:

"Resolved, That we are opposed to the present oppressive registry law, and that we will vote for no candidate for either house of the Legislature who is not pledged to its speedy repeal."

With these remarks upon composition, we proceed to lay before the reader a series of resolutions upon various ordinary subjects, which may possibly afford him hints, or serve for the nucleus of others.

OF REPORTS

A report is the written statement of a person having a particular matter in charge, of the acts officially performed, or of a committee concerning the results of an investigation or matter confided to their care. The matter of the report is regulated by the same rules, as regards its style and nature, as govern resolutions.

RECAPITULATION OF CERTAIN POINTS

In order to impress certain points more strongly on the mind, we present in a condensed form the rules in regard to matters likely to confuse the reader.

I. MOTIONS IN ORDER DURING DEBATE

These in their order of precedence are:

1. To adjourn.
2. To lay on the table.
3. To postpone indefinitely.
4. To postpone to a day certain.
5. To commit.
6. To amend.

II. MOTIONS IN THEIR ORDER OF PRECEDENCE

1. To fix time [and place, if desired] of adjournment.
2. To adjourn.
3. For the order of the day.
4. To lay on the table.
5. For the previous question.
6. To postpone indefinitely.
7. To postpone to a time certain.
8. To commit.
9. To amend.

III. MOTIONS IN ORDER WHEN A MEMBER HAS THE FLOOR

1. Call to order.
2. Appeal from decision of the chair.
3. Objection to considering a question.

[Not in order if debate have already begun on the subject.]

4. That the question be discussed.
5. For the order of the day.

IV. MOTIONS OPENING MAIN QUESTIONS TO DEBATE

1. To strike out enacting clause of bill or ordinance [of course, not applicable in private societies, and used in State or Municipal Legislatures when it is desirable to force the fight on the measure at the second reading].
2. To commit the question.
3. To refer.
4. To postpone indefinitely.
5. To reconsider a debatable question.

V. SUCCESSFUL MOTIONS THAT CAN NOT BE RECONSIDERED

1. Adjournment.
2. To take from the table.
3. To reconsider.
4. That the committee rise.
5. To suspend the rules.

VI. MATTERS NOT SUBJECT TO AMENDMENT

1. Motion to adjourn.
2. Amendment to an amendment.
3. An appeal from the decision of the chair.
4. A call to order.
5. Motion for leave to continue speaking after having been pronounced out of order.
6. Motion to lay on the table.
7. Objections to the consideration of a question.
8. Motion for the order of the day.
9. Motion to indefinitely postpone.
10. Call for the previous question.
11. Motion to reconsider.
12. Motion that the committee rise.
13. Motion that a question be discussed.
14. Motion to suspend the rules.

15. Motion to take from the table.
16. Motion to take up a question out of the proper order.
17. Motion for leave to withdraw a motion.

VII. NON-DEBATABLE MATTERS

1. A motion to adjourn. But a motion to fix the time to which the Society shall adjourn, when it does adjourn, is debatable.
2. An appeal from the decision of the chair, when a question of decorum is in debate, or to the priority of business. And no appeal can be made the subject of debate while the previous question is pending.
3. A call to order is not debatable.
4. Motion to extend the limit of debate.
5. Motion to have leave to continue speaking after having been pronounced out of order.
6. Motion to lay on the table.
7. Motion to limit debate.
8. Objection to the consideration of a question proposed.
9. Motion for the order of the day.
10. Motion for the previous question.
11. Questions in regard to priority of business.
12. Call for the reading of papers.
13. To reconsider an undebatable question.
14. Motion that the committee rise.
15. Motion to allow the question to be discussed.
16. Motion to suspend the rules.
17. Motion to take from the table.
18. Motion to take up a question out of proper order.
19. Leave to withdraw a motion.

VIII. FORMS OF PUTTING CERTAIN QUESTIONS

In putting the question on an appeal, the chair does not ask if the decision of the chair be overruled, but—*"Shall the decision of the chair be sustained?"* or *"Shall the decision of the chair stand?"* If there be a tie vote, the decision of the chair is overruled, because of the lack of a majority.

In putting the question on striking out certain words, it is put—*"Shall these words* [naming them] *stand as part of the resolution?"* If there be a tie vote, they are struck out, because a majority have not pronounced in their favor.

On a demand for the order of the day, the question is put—*"Will the Society* [council, club, whatever it is] *now proceed to the order* [or orders] *of the day?"*

On a demand for the previous question, the form is—*"Shall the main question be now put?"*

On an objection to the consideration of a question, if made at the time of the introduction of the subject, the form is—*"Shall the question be considered?"*

On putting the yeas and nays—*"As many as are in favor of the motion* [or resolutions] *will, when their names are called, answer Aye. Those of the contrary opinion, No. Mr. Secretary, call the roll."*

On a call for the yeas and nays—*"As many as are in favor of calling the yeas and nays will, when their names are called, say Aye. Mr. Secretary, call the roll."* When the requisite number have answered the Secretary suspends calling, reports result to chair, who says [naming the number], *"In the affirmative. The yeas and nays are ordered."* Or, if there be no objection, he may say—*"Those in favor of calling the yeas and nays will rise and remain standing till counted."* He then counts them audibly, and announces the number and result. But if any member cries "vote" or otherwise dissents, the roll must be called for the ayes only.

IX. TWO-THIRDS VOTE

There is no such thing naturally as the necessity of a two-thirds vote. By the rules of order, a majority suffices to order the previous question, to limit the time of speeches, to limit the debate—which last is virtually ordering the previous question at a fixed hour—or to consider a question when objected to; while to suspend the rules, or amend them, or to make a special order, or to move for the discussion of a non-debatable question, or to take up a question out of its order—the three last amounting to a suspension of the rules—requires unanimous consent.

But while this is the practice in legislative bodies, in ordinary organizations, where celerity in the despatch of business is not of great importance, where the previous question is looked upon as a device to prevent the minority from expressing an opinion, and where a suspension of the rules is more frequently necessary, the following special rule is sometimes adopted:

It shall require a two-thirds vote of the members present at any meeting to call the previous question, to limit debate, to fix a specified hour for closing debate, to consider a question when objected to on its introduction, to make a special order, to suspend or to amend the rules, to order the discussion of a subject non-debatable under the rules, or to take up a question out of its order.

This may be placed in the constitution or by-laws of the society, when it will become paramount law, to which the rules of order opposed to it must yield.

The safest mode, however, will be found to adhere to the parliamentary rules.

X. MATTER-OF-COURSE QUESTION

To expedite business, that to which no one objects, when stated by the chair, is considered ordered. Thus, the reception of a report, calling for division, reception of communication, withdrawal of a motion before the house, leave to continue speech in order after being pronounced out of order, etc., are permitted without a vote, if no objection be made. So in making a motion, which strictly (when not a question of order, an objection to the consideration of a question, or a call for the order of the day) requires to be seconded, it is always taken for granted that it has been, unless some one should violate courtesy so far as to inquire. In that case, it must be seconded, or it falls to the ground.

It is considered unfair to insist upon the seconding of a motion, because it violates the natural right of a member to get a proposition in good faith before the house; but, if his motion be made for dilatory purposes, or to annoy and weary out the majority, or be in effect, though not in shape, offensive to the house, it is eminently proper that he should have at least one member to back him in his attempt; and it is no discourtesy to cut off his discourtesy by demanding the seconder.

THE LETTER-WRITER

EVERY position in life demands letter-writing. A letter is the great link between parents and children, between lovers, between friends; while in business relations it makes fortunes, or mars them. A good letter must, first, be absolutely correct in every mechanical detail; then style comes into question; then the matter, which must be intelligible to the meanest as well as the highest understanding. The great art of letter-writing is to be able to write gracefully and with ease, and no letter should wear the appearance of having been laboriously studied.

There are two things to be considered in letters. The first is that the grammatical and rhetorical form should be correct—and most of these matters have already been treated. The second is that the *form* of the letter should be suitable to the object in view. Since there are very many occasions when letters must be written for particular purposes, both business and social, it is a great help to the writer to have at hand sample forms that may be used for his purpose, or that may guide him in expressing himself more directly to the point. For this reason a number of model letters have been included in this article, and reference to these pages will frequently help the writer to find the very form he wishes to use for a particular occasion.

ESSENTIAL POINTS IN LETTER-WRITING

HANDWRITING.—The first point to be observed in your letter is that you write in a clear, legible hand, that anybody and everybody can read. You may fill your pages with the most exquisite and sparkling ideas, but if they can not be read except to the torture of the peruser, your diamond thoughts lose all their sparkle.

ORTHOGRAPHY is next to be considered. Bad spelling is disgraceful, and many people spell badly from simple carelessness. Read carefully the works of the best authors. Write extracts from these works. and you will intuitively spell correctly. Your sense will become offended at a misspelt word. Use the simplest language. Always have a dictionary beside you, but never consult it unless you are in doubt. Once consulted, you should remember the word ever afterward. Never divide your words into syllables at the end of the line unless you can not help it. If you have space for the first syllable, let your hyphen be bold. Thus:

It is sometimes a great consolation to me that, etc., etc.

A word of one syllable must not be divided. Bring it bodily over to the next line.

Compound words must be divided into the simple words composing them. Thus: War-whoop, not warw-hoop; bread-stuff, not breadst-uff.

GRAMMAR.—The essential principles of grammar and punctuation having already been explained in former articles, it will not be necessary to repeat them here. If one is uncertain on these points he can do no better than to study them carefully before proceeding. On the questions of capitalization, style, etc., a few words may be added here.

CAPITALIZATION.—The capital letters only set apart the sentences and paragraphs, and while their proper use adds greatly to the beauty of an epistle, their omission or improper use will make the pages present a perfectly absurd appearance. In places other than at the beginning of sentences their use is determined by the following rules:

Capitals:

(1) Begin all names of persons or places.

(2) Begin all titles, as President, Vice-President, General, Doctor, or Captain.

(3) Begin the words, North, South, East, West, and their compounds and abbreviations, as North-east, S. W.

(4) Begin the names of the Deity and Heaven, or the pronoun used for the former, as, in His mercy—Thou, Father.

(5) Begin all adjectives formed from the names of places or points of the compass, as English, Northern.

(6) Begin every line of poetry.

(7) Begin all quotations.

(8) Begin all titles of books, and usually each important word of the title, as, "Bancroft's History of the United States."

(9) Begin the name of any historical event, as the Civil War, the Revolution.

(10) Begin all the names of the months, as June, April, August.

(11) Begin all addresses, as, Dear Sir—Dear Madam.

(12) Must, however, never be placed in the middle of a word, nor, except in accordance with the foregoing rules, in the middle of a sentence. However, the pronoun "I," and the interjection "O," must invariably be capitals. The interjection "oh," and the other pronouns, "you," "he," "she," etc., are capitalized *only* when they begin sentences, paragraphs, or quotations.

LITERARY STYLE, or the method of self-expression, can not be defined by rules. Each one's style is peculiarly his own. Quote as little as possible, and avoid the use of too many adjectives. Avoid long sentences, and florid language.

Be very careful not to repeat the same word. Tautology is a crime in writing. Read this and see how you like it:

"Willie has *come*. Johnny will *come* tomorrow. Will you *come* and spend a day with us? Make Susie *come*. Summer has *come* at last."

This is tautology. Do not underline unless in very extreme cases.

"You know, darling, how *intensely* I *love* you," is perhaps excusable.

Never abbreviate except in business. Dates should be given in figures, and money, in parentheses, thus, "ten thousand dollars ($10,000)."

Begin a letter this way:

RICHMOND, VA.,
June 1st, 1901.

or

NEW YORK, Sept. 7th, 1901.

Avoid postscripts. They are only embarrassing. Take your envelope, and having neatly folded your letter, place it in the envelope, close the envelope and address in the most legible manner.

ABBREVIATIONS.—Abbreviate the names of the States as follows:

Maine, Me.; New Hampshire, N. H.; Vermont, Vt.; Massachusetts, Mass.; Rhode Island, R. I.; Connecticut, Conn.; New York, N. Y.; New Jersey, N. J.; Pennsylvania, Penn. or Pa.; Delaware, Del.; Maryland, Md.; Virginia, Va.; North Carolina, N. C.; South Carolina, S. C.; Georgia, Ga.; Alabama, Ala.; Mississippi, Miss.; Missouri, Mo.; Louisiana, La.; Tennessee, Tenn.; Kentucky, Ky.; Indiana, Ind.; Ohio, O.; Michigan, Mich.; Illinois, Ill.; Wisconsin, Wis.; Arkansas, Ark.; Texas, Tex.; Iowa, Ia.; Florida, Fla.; Oregon, Ore.; California, Cal.; Minnesota, Minn.; District of Columbia, D. C.

REPLIES

There is no greater mark of good-breeding and politeness than the prompt reply to a letter. Never lose a moment, if possible, in replying to one. If the reply requires delay, write to acknowledge receipt of the letter. Never reply by proxy if you are able to write yourself.

Never write on a half sheet of paper.

Avoid pedantry.

Never write a congratulatory letter upon

mourning-paper, even if you are in mourning.

Never try to patch an ill-formed letter.

If you add your own address to a letter, put it under your signature, thus:

Very respectfully,
ROBERT R. WHITE,
154 R—— St.,
New Orleans, La.

Date every letter clearly and carefully. It is often of the utmost importance to know when a letter was written.

We give examples of the forms of letters in general use. These will act as guides to the inexperienced.

LETTERS OF INTRODUCTION.—Never seal a letter of introduction. Mention the business in which the party whom you are introducing is or was engaged. Write the name of the party introduced in the left-hand corner of the envelope containing the introduction. Thus: you wish to introduce Mr. Charles Kendrick of Louisville, Ky., to Mr. Henry Blachford of New York. Direct your letter as in the accompanying example:

Henry Blachford, Esq.
70 West 50th St.,
New York.

Introducing
Charles Kendrick, of Louisville, Ky.

If you want to be stylish, send your letter of introduction, with your card, by the servant at the private residence of the person to whom you are introduced. Send a letter with your card if you present it at a business office.

EXAMPLES OF CORRECT LETTER-WRITING

INTRODUCING ONE LADY TO ANOTHER

CHICAGO, *June* 1, 1901.

DEAR EMILY:

This letter will introduce my dear friend Mrs. Thomas Frost, of whom you have heard me speak so much. I feel assured that this introduction will prove of considerable pleasure to both of you.

Any attention you show her during her stay in Gotham will be appreciated by

Your affectionate friend,
JULIA M. HAWS.

MRS. JOSEPH M. MINTURN.

INTRODUCING A YOUNG LADY SEEKING EMPLOYMENT

POUGHKEEPSIE, *June* 1, 1901.

DEAR MR. JONES:

The young lady whom this letter will make known to you is desirous of obtaining employment in your city, and I use our old acquaintanceship as the bridge to your good offices in her behalf. She has received a very liberal education and would prove of immense value to a family whose young children needed careful and judicious teaching. She is gentle, amiable, and willing. I trust you may be able to serve her.

I am, etc.,
Dear Mr. Jones,
Your sincere friend,
R. A. APPLETON.

MR. W. F. JONES.

INTRODUCING A GENTLEMAN SEEKING A POSITION IN A BUSINESS OFFICE

ALBANY, *June* 1, 1901.

MY DEAR SIR:

Recognizing your well-merited and extensive influence in the commercial circles in your city, I beg to introduce to you W. James Farms, who is desirous of obtaining a clerkship with some business house. He is a gentleman of capacity and ability. His character stands A 1, and he is as industrious as he is energetic. He considers New York a better field than this place, and prefers to try his chances there to remaining here. He can refer to me. Trusting that you will lend him a helping hand, I am,

Yours very truly,
JOSEPH LYNCH, Esq.
JACOB HILL.

INTRODUCING A YOUNG MARRIED LADY TO A FRIEND IN HER NEW HOME

STAMFORD, CONN., *June* 1, 1901.

MY DEAR MAMIE:

Mrs. Holcroft will present this note, and when I tell you that she is a bride, and is about to settle in your town, I feel that I have secured her a pleasant friendship, and that she will find in you an old *new* friend in the midst of strangers. I know that you will pay her all the attention that lies in your power for the sake of auld lang syne.

Your loving friend,
BLOSSIE.

MRS. W. T. MARSDEN.

INTRODUCING A DAUGHTER ABOUT TO MAKE A VISIT

CLEVELAND, O., *June* 1, 1901.

MY DEAR MRS. BECKER:

My daughter Ellen will present this in person, as her introduction to her mother's old friend, whose kind invitation to spend a few weeks she accepts, *con amore*. That she will have a delightful time is among the few certainties in this very uncertain life. You may find her a little shy and reserved, but under your care she will soon feel herself as much at home as in Euclid Avenue, Cleveland. With warmest regards to your husband, and lots of love to yourself, I am,

Your sincere friend,
CATHERINE E. LAWSON.

MRS. JOSEPH BECKER.

INTRODUCING A GENTLEMAN TO A LADY FRIEND

WARRENSPORT, ME., *June* 1, 1901.

MY DEAR MISS TENTINE:

My friend Mr. Robert George Balfin, by whom this letter will be presented, is about to settle in

Dayton. As your hospitality is proverbial, may I hope for a little slice of it for him? And I look forward to good reports from both of you as to the ripening of a friendship the seed of which is now sown by

Your very sincere friend,
JOHN G. SHEAR.

ORDERING A SUPPLY OF GOODS FOR A STORE IN THE COUNTRY

SPIKE, THOMPSON COUNTY, KY.,
June 1, 1901.

MESSRS. PARK & TILFORD, NEW YORK:

GENTLEMEN—I have just opened a large grocery store in this place, and the prospects of success seem assured. I should be happy to deal with your firm. I can refer you to Robinson & Charles, of 270 Broadway, New York. This being our first transaction, I shall be prepared to pay the express co. upon delivery of goods, if you will forward me your account, with the usual cash discount, by a previous mail.

Inclosed please find order, which I should wish filled as promptly as is consistent with your convenience.

Very respectfully,
R. M. MACARTHY.

REPLY TO THE ABOVE

BROADWAY, NEW YORK,
3 *June*, 1901.

MR. R. M. MACARTHY:

DEAR SIR—Your favor of the 1st to hand. We shall be pleased to open an account with you, Messrs. Robinson & Charles having spoken very highly of you.

We have this day forwarded to your address the goods according to your invoice, but being desirous of obtaining your approval of their quality and value, will await your examination for the inclosed bill, which is subject to 5 per cent discount for prompt cash. A post-office order or draft on one of our city banks will suit our convenience equally well as collection by Dodd's Express.

Hoping to receive further orders, we are,
Yours respectfully,
PARK & TILFORD.

LETTER PROPOSING TO SELL GOODS ON COMMISSION

DRAKEVILLE, YOUNG CO., MD.,
January 28, 1901.

MESSRS. SHORT & STELT:

GENTLEMEN—I have been in business in this town for over twelve years, and refer to the National Bank, and to Mr. James E. Townsend, ex-Mayor and a prominent citizen. I see a good opening for increasing my sales, and am desirous of a supply of your goods to sell on commission. If required I will give you full security against any loss.

Should this proposition meet your views, please fill the accompanying order, and give me the benefit of your most favorable terms.

Respectfully,
JOHN RILEY.

REPLY TO THE ABOVE

BALTIMORE, *February* 2, 1901.

MR. JOHN RILEY:

DEAR SIR—We have to-day forwarded by Dodd's Express the goods ordered per your letter of the 28th *ult.*; the inquiries about you, as suggested by you, having proved most satisfactory. The commission is 10 per cent. The bill of sale accompanies each package.

Trusting this opening will lead to a long connection of mutual benefit,

We are, yours respectfully,
SHORT & STELT.

REQUESTING THE SETTLEMENT OF AN ACCOUNT

MILWAUKEE, WIS., *July* 30, 1901.

MR. T. W. INGRAM:

DEAR SIR—As we have a large payment to make at the end of next week, and as your account remains unsettled, we must beg of you to send us a check for same by Tuesday next. We are reluctant to press you, but we are pressed ourselves.

Very respectfully,
SMITH & BROWN.

REQUESTING PAYMENT OF RENT

E. 29TH ST., NEW YORK,
March 27, 1901.

MR. PATRICK K. CHISELHURST:

DEAR SIR—I must call your attention to the fact that, although your agreement for the house rented by you from me stipulates monthly payments in advance, you have failed to pay for three months and are now in arrears $206.

If you fail to pay the account within six days I shall be reluctantly compelled to place the matter in the hands of my lawyer for collection.

Very respectfully,
THOMAS VOSBURG.

FROM A LADY IN THE COUNTRY ORDERING GOODS

MAIDA VALE, TEWKSBURY CO., MASS.,
January 18, 1901.

MESSRS. CALICE & TWIST,
Washington Street, Boston:

GENTLEMEN—Please send me by Dodd's Express the following goods:

12 yards of green gauze.
24 yards gingham.
2 pair of six-button gloves, lavender color, size 6 1-4, Dent's make.
6 pocket-handkerchiefs, plain white, with broad hemstitched border.

Also please send pattern of black satin of a good quality, price marked.

The goods must be sent to Warrington by rail, and to Mr. William Snipe, 240 State Street, who will pay C. O. D.

Direct as follows:

MRS. WILSON TOFT,
Warrington Station,
Tewksbury Co., Mass.

TO THE FATHER OF A YOUNG LADY, ASKING HER HAND IN MARRIAGE

WASHINGTON AVENUE, BROOKLYN,
March 12, 1901.

SIR—I venture to hope that you will call all your friendly feelings to my assistance, in considering a proposal I am about to lay before you, in which my happiness is completely concerned.

For a long time past your daughter, Effie, has held a strong hold over my affections, and I have reason to believe that I am not indifferent to her. My position is such as to warrant my belief that I could support her in the style of comfort which she so well deserves, and which it has been your constant aim to provide for your children. As regards my character and disposition, I trust they are sufficiently well known to you to give you confidence in the prospect of your child's happiness.

I have not, however, ventured on any express declaration of my feelings, without first consulting you on the subject, as I feel persuaded that the straightforward course is always the best, and that a parent's sanction will never be wanting when the circumstances of the case justify its being accorded.

Anxiously awaiting the result of your consideration on this important and interesting subject,

I remain, sir,
Your most faithful and obedient servant,
EDWARD L. SPRING.

To
W. PARSONS, ESQ.

EXPLAINING AN APPARENT SLIGHT

BOSTON, *March* 8, 1901.

DEAREST JULIA—How could you consider me capable of inflicting a slight upon yourself, in whom are centred all my hopes of happiness? Nothing more than ordinary courtesy was intended by my attentions to Miss Frith. That she was a comparative stranger to the Stanleys, induced me to pay her those attentions which have occasioned you so much annoyance, but which otherwise I would not have considered myself justified in tendering.

I regret from my soul that anything should have occurred to originate in your mind a doubt of my sincerity.

Your truly affectionate,
GEORGE ROGERS.

To MISS JULIA TILGHMAN,
No. — N. Fifteenth St., Philadelphia.

ON RECEIVING A FAVORABLE REPLY TO A PROPOSAL

NEWTON, N. Y., *March* 20, 1901.

DARLING . . . .—Words can not express my rapture on finding your note on my table last night. How delightful was it to find a letter—and *such* a letter!—from one whom I may now hope to hail as the companion of my whole future life! The weight taken off my mind by the candid and gentle confession of one whose love seemed too great a happiness to hope for is beyond description. To-morrow I shall hasten to the presence of her from whom I hope I may never henceforth be parted; but I could not retire to rest without making one feeble attempt to express my ecstasy at finding that hopes so flattering have not been in vain.

Believe me, darling,
Your devoted and happy
TOM.

COMPLAINING OF NOT RECEIVING A LETTER

CLIFTON, *January* 7, 1901.

DEAR AGNES—Four days have passed without my receiving a letter from you, and I am in painful anxiety lest illness should be the cause. Pray write quickly, or I shall really feel inclined to quarrel with you as an idle girl; nay, I shall absolutely grow jealous, and fancy that some more favored suitor is undermining the affections of my dear girl.

But I have no fears. I too well know that your innate goodness of heart would prevent your trifling with the feelings of any one; so, hoping you will take this little scolding in good part, and relieve the offence by a very long letter as speedily as your dainty fingers can write, believe me,

Dear Agnes,
Your affectionate
ED.

ON A BIRTHDAY

NEW LONDON, *June* 1, 1901.

MY DEAREST FANNIE—How sad it is that I am hindered from being with you on this dearest of all days of the year.

Accept, dearest, the inclosed portrait. I feel that its original is too deeply stamped on your heart to require any effigy to remind you of him. It is, however, the most appropriate present I could offer to the cause of my happiness on this brightest of all days.

God grant that every succeeding year may see you increase in all that is charming in body and mind, and believe me,

My dearest Fannie,
Your own
JOHN.

A COMPLAINT

July 10, 1901.

DEAR MAUDIE:

It is with pain I write to you in aught that can seem like a strain of reproach, but I confess that your conduct last night both surprised and vexed me. You received Mr. Watson's attentions in so marked a way that I feel it due to yourself to comment on your conduct. Believe me, I am in no way given to idle jealousy; still less am I selfish or unmanly enough to wish to deprive any girl on whom I have so firmly fixed my affections of any pleasure to be obtained in good society. But my peace of mind would be lost forever, did I believe that I had lost one atom of your affection.

Won't you write, and assure me that you still preserve your undivided affection for

Your devoted but grieved
FRED.

CONGRATULATING A FRIEND ON HIS MARRIAGE

OMAHA, *August* 20, 1901.

MY DEAR TOM:

As you have entered the enviable state of wedlock, and are no longer the merry bachelor formerly the butt of my crude jests, I must address you in a tone of greater gravity than has been my custom. My dear friend, I sincerely congratulate you upon this desirable change; for in your choice of a partner you have given evidence of the possession of a sound judgment and much good taste. If my beneficent wishes were the only requisite to ensure your happiness in the married state, you would never have occasion to regret the step you have recently taken; for there is no one whom I more ardently desire to see surrounded with all the blessings of this life.

Have the kindness to present my respectful compliments to Mrs. Armitage, and believe me ever to remain

Your sincere well-wisher and friend,
EDWARD KEOGH.

CONGRATULATING A GENTLEMAN UPON HIS MARRIAGE

YANKTON, *June* 1, 1901.

DEAR BILL:

I have just received the welcome message that informs me of your new happiness. I hasten to offer you my most sincere congratulations and hearty good wishes. May every year of your married life find you happier than the last, and may Mrs. Chiffins find you as loyal a husband as you have been a friend.

From my inmost heart, dear Bill, I say, God bless you and your bride with His choicest blessings.

Ever your friend,
GEORGE MEYERS.

WILLIAM CHIFFINS, Esq.

CONGRATULATING A LADY UPON HER MARRIAGE

K ST., WASHINGTON, D. C., *August* 3, 1901.

DEAR JOSIE:

Your cards have just reached me, and I write at once to try to express my heartfelt pleasure at your happy prospects. It is a great pleasure to your loving friends to be able to feel so much esteem and affection for the gentleman to whom you have confided your life's happiness, and to hope, as I do, that every year will unite your hearts more closely.

That Heaven may bless you both, dear Josie, is the earnest prayer of

Your loving
JULIA ROBINSON.

MRS. CLIFFORD DOYLE.

CONGRATULATING A FRIEND ON THE BIRTH OF A SON

BATAVIA, N. Y., *July* 5, 1901.

MY DEAR JOE:

What luck! A son born on the great 4th. May he prove as good, as pure, and as honest a man and patriot as George Washington. What more

can I say, old fellow, except to add that I earnestly trust that Mrs. Clithroe and George W. are doing well?

Yours, always sincerely,
A. D. Hervy.

Joseph Clithroe, Esq.

CONGRATULATING A FRIEND ON THE BIRTH OF A DAUGHTER

Pegasus, Westchester Co., N. Y.,
April 10, 1901.

Dear Millie:

I congratulate you most heartily on your new acquaintance, and if "missy" only grows up like "mamma," the boys will be around pretty lively. I suppose your husband is two feet taller. Take great care of yourself and the wee little lady. I hope very soon to come round to congratulate you in person.

Your very sincere friend,
James Todhunter.

Mrs. E. F. Everligh.

SEEKING A CLERKSHIP

Troy, *May* 4, 1901.

Gentlemen—Perceiving by your advertisement in the N. Y. *Herald* that you are in want of a clerk, I beg to inclose testimonials, and venture to hope that from my previous experience in the line of business you pursue I should be of some use in your establishment. My habits of life are such as to assure regularity in the discharge of my duties, and I can only assure you that, should you honor me with your confidence, I shall spare no pains to acquit myself to your satisfaction.

I remain, gentlemen,
Yours very truly,
Harry Sanderson.

To Messrs. Griffiths & Co.

APPLICATION FOR SUBSCRIPTION TO A CHARITY

Midgeville, Tenn., *October* 8, 1901.

Sir [or Madam]:—I take the liberty of inclosing a prospectus of an institution which is likely to have a most beneficial effect upon the poor in our neighborhood. [*Here state particulars.*] From your well-known liberality, I trust you will excuse this appeal from a stranger in furtherance of an act of benevolence, and remain,

Sir [or Madam],
Very respectfully yours,
Julia [or John] Smith.

DECLINING

30 West 27th St., New York,
29th *October*, 1901.

Mr. Thomas Jones regrets exceedingly that the numerous applications for kindred purposes near home render it impossible for him to comply with the request contained in Mr. [or Mrs.] ——'s letter of the 18th October.

SOLICITING RENEWAL OF A PROMISSORY NOTE

Ark St., Mobile, May 7, 1901.

Gentlemen—You have in your possession my note for $1,000, payable May 14, which I am sorry to say I can not meet at maturity, owing to a combination of circumstances adverse to my interests, and not anticipated. If you will do me the favor to renew it for ninety days, with interest added, I do not doubt my ability to redeem it when due. A compliance with this request will confer an obligation upon, and oblige,

Faithfully yours,
Thomas Moran.

To Messrs. Sadler & Co.,
30 William St., N. Y.

TO A FIRM, WITH AN INSTALMENT

Dean St., San Francisco, Cal.,
May 20, 1901.

Gentlemen—Inclosed please find $500 in notes of San Francisco banks, which I will thank you to place to my credit, as the first instalment upon my bill, now overdue nearly two months. The balance will be remitted during the second week in June, if not before that time. I regret the inconvenience caused you by my delay, which is a result of our system of long credits, and entirely beyond my power to control.

I remain, gentlemen,
Yours most sincerely,
William Dempsey.

Messrs. Hatch, Wight & Co.,
333 Broadway, New York.

OFFERING A LOAN OF MONEY FOR BUSINESS PURPOSES

Elizabeth, N. J., *Dec.* 15, 1901.

Dear Robert—Knowing that you are desirous of starting in business for yourself, I write to say that it is in my power to offer you a loan of two thousand dollars ($2,000) without interfering in any way with my own business or expenditures. I trust that you will let me have a friend's privilege, and that you will accept the money on such terms as may best suit you.

With best wishes for your success,
I am your friend,
Austin Keep.

Robert Rowe, Esq.

ON THE DEATH OF A HUSBAND

Fordham, N. Y., *Nov.* 29, 1901.

My dear Mrs. Manning:

Words fail to convey my feelings of sorrow on receipt of the intelligence of the death of my old and esteemed friend, your late husband. My own grief at the loss of a true friend teaches me how crushing must be your affliction. May the Almighty in His goodness console you in this dark hour of your tribulation.

Believe me always your true and sincere friend,
Joseph Butler.

ON THE DEATH OF A WIFE

Providence, R. I., *November* 8, 1901.

My dear George:

I know how futile it is to address words, idle words, to you in this moment of supreme anguish, with which it has pleased God to visit you, and I shall not say more than that the loss of your pure, good, and beautiful wife is a source of deep sorrow to the numerous friends who had the privilege of knowing her, and to none more than

Yours, in deep sympathy and affection,
Terrence Barker.

ON THE DEATH OF A SON

Norwalk, Conn., *June* 3, 1901.

My dear Julia:

If God has plucked the bright blossom from your home, it is for a purpose none of us dare divine. He alone can pour balm upon your crushed heart. The holy joy is yours of knowing that angel eyes now watch for your coming, and that your beautiful boy will receive you when "life's dark day is done."

If the tenderest of much-loving sympathy could soothe you, dear Julia, learn that you have it from your

Friend,
Laura.

ON THE DEATH OF A MOTHER

Tewksbury, Mass., *Nov.* 8, 1901.

My dear Charles:

You have lost your mother. There is a very wail in the words. She can never be replaced.

The dear, good lady has passed away to a better land, cheered by the knowledge of your love and affectionate tenderness, consoled by the thought that her teaching, when you were a little boy at her knee, has not been in vain, and that she leaves behind her for a little while a son who treads the path of rectitude and of honor. Dear Charles, ever remember that your darling mother watches you from on high, and that, as she was devoted to you in life, so she is devoted to you in death.

God sustain you under this heavy affliction.

Your true friend,

JOHN TRAVER.

REPLIES TO ADVERTISEMENTS

BOOK-KEEPER

28 WASHINGTON ST., BOSTON, MASS.,
October 20, 1901.

TO MESSRS. WINSOLE, BIRD & CO.:

GENTLEMEN—In reply to your advertisement in this day's *Transcript* for a competent book-keeper, I respectfully beg to offer myself as candidate for that position. I have been in the employment of Mr. Thomas Lepy, 19 Tremont Street, in this city—the large dry-goods store—in the capacity of book-keeper for the last three years, and am about to leave on the 1st *proximo*, as Mr. Lepy intends to retire from business.

Mr. Lepy has authorized me to offer him as reference as to character and ability. I can also refer to Messrs. Rose & Pickwick, 17 Remsen Street, with whom I clerked for a year and a half.

Hoping to be fortunate enough to suit your requirements,

I am, gentlemen,

Respectfully,

JOSEPH SUTCLIFF.

GENERAL EMPLOYMENT

NEWBURG,
11th Sept., 1901.

SIR—I hasten to reply to your advertisement in the N. Y. *Sun* of to-day. I am most desirous of obtaining employment, and would not consider present emolument so much an object as the prospect of a permanent and respectable situation.

I am a young man (age 21), and single. I have received a good commercial education, and am versed in book-keeping and accounts generally. In other respects I am willing to render myself generally useful, and, although I have not hitherto filled a situation, I doubt not but that in a short time I shall be able to fulfill any duties assigned to me.

In the event of your doing me the honor to select me for the proffered employment, I can furnish you with satisfactory testimonials as to character, and can, if necessary, provide guarantees for fidelity.

Trusting that I may have the honor of hearing from you in reply,

I remain, sir,

Yours very truly,

JOSEPH L'ESTRANGE.

To

W. HENRY CULLINAN,
27 Wand St., N. Y.

FROM A YOUNG MAN TO A FRIEND, SOLICITING A SITUATION

MOHAWK, *March* 28, 1901.

DEAR EDWARD:

When you left Galveston, you were kind enough to promise that should it be in your power to forward my interest in any manner you would fee a pleasure in so doing. I am now in want of a position, my former employer having sold his business, and his successor having, as he informs me, a sufficient number of hands for all the work he is likely to have. If, therefore, you should hear of any situation or employment which you consider likely to suit me, either in my own business, that of a clerk, or in any other in which I can make myself useful, your recommendation would greatly oblige, and be of material service to,

Dear Edward,

Yours very truly,

JOHN JAMES.

ASKING PERMISSION TO REFER TO A PERSON

NEW HAVEN, CONN.,
July 7, 1901.

DEAR SIR:

As I have had the honor of being known to you for some years, during which period I trust my conduct has impressed you favorably, I take the liberty of soliciting at your hand the following favor:

Messrs. Sebthorp, of Beaver Street, New York, are in want of a correspondent at London, and as I am about to proceed there on some affairs of my own, and shall probably take up my residence in that capital for some years, I am anxious to secure a post which appears to me in every way eligible, and accords with my views exactly.

As a matter of course, Messrs. Sebthorp desire testimonials as to my capacity and integrity, and as you are in a position to speak positively on these points, I have written to ask you whether I may so far trespass on your kindness as to mention your name by way of reference.

Should you kindly grant this request, I need scarcely assure you that my endeavor will be to prove both to Messrs. Sebthorp and to yourself that you have not been mistaken in your opinion of me, while I shall ever feel grateful for this further instance of the interest evinced by you in the welfare of

Your truly obliged,

WALTER MOTT.

To

MR. GEORGE FOULKE,
7th St., Cincinnati, O.

CLERK

29 GROVE ST., ST. LOUIS, MO.,
November 16, 1901.

MR. ISAAC WATERS:

SIR—I see by this day's *Republic* that you are in want of a competent clerk, and I respectfully beg to apply for the position. Owing to the financial difficulties of my late employers, Messrs. Kendrick & Warts, with whom I was clerk for eight years, I am out of employment. I can refer to either of these gentlemen for a testimonial as to my industry, good conduct, and ability. I may add that I am a teetotaler.

Hoping to receive a favorable reply,

I am,

Respectfully,

RUDOLPH MEYER.

COOK

100 WEST 28TH ST., NEW YORK,
March 18, 1901.

MRS. WILLIAM HOWARD:

DEAR MADAM—Having seen your advertisement for a plain cook in this day's *Herald*, I respectfully apply for the place.

I can cook plain joints and do all manner of plain cooking, as my present employer, Mrs. James Posnett, is willing to testify. As Mrs. Posnett is going to Europe on the 1st of April, I shall be out of a place on that day. A line to Mrs. Posnett will satisfy all inquiries in regard to my character and capacity.

Respectfully,

JANE MATTHEWS.

GOVERNESS

19 BLEECKER ST., BOSTON,
July 27, 1901.

MRS. E. F. SLOCUM:

MADAM—In reply to your advertisement in to-day's *Courier* for a governess to teach three little

girls French, German, and English, I hasten to inform you that I am a graduate of Vassar, Class 1899; that I have resided one year in Paris and five months in Vienna, sojourning in both capitals for the purpose of completing my knowledge of French and German.

I have been governess in the family of Mr. George F. Witmore, but owing to the death of my dear little pupil, their only daughter, Ada, I have been thrown out of employment. In addition to my college and academy testimonials, I beg to refer to Mrs. Witmore, Holly Park, Brookline, and to the Rev. Mr. Brooks, St. Matthew's Church.

Hoping to be favored by your selection,
I am, madam,
Yours respectfully,
MIRIAM J. PACKARD.

A FEW LINES ACCOMPANYING A GIFT

A WEDDING GIFT

200 FIFTH AVENUE, NEW YORK,
18*th April*, 1901.

Nelly Suter sends her best love, and best wishes, to Susie Lorimer, and a little bracelet as a souvenir of an event that Nelly trusts will ever prove as happy and auspicious as she wishes it to be.

CHRISTENING GIFT

HEATH HOUSE,
June 18, 1901.

God-papa sends little Mamie a coral, to enable her to cut her teeth, but not the acquaintance of
JOSEPH CHAMBERS.

FLOWERS

15 MADISON AVENUE,
19 *July*, 1901.

Roses become Miss Irwin so much, that Mr. Harnett earnestly hopes to see the accompanying bunch in Miss Irwin's corsage this evening at Wallack's.

MUSIC

13 CHESTNUT ST., PHILADELPHIA,
28*th November*, 1901.

Mr. John St. Ruth presents his compliments to Miss Delamore and begs to send her a few selections from the operas, her singing last night at Mr. Hamlyn's having reminded him of the most celebrated *prima donnas*.

ARITHMETICAL AMUSEMENTS

THERE is a saying to the effect that "there is nothing more deceptive than facts, unless it be figures." This means that there are more surprising combinations of sober figures possible than the wildest imagination could readily suspect. It is not necessary to resort to some of the common "tricks" with figures—such, for example, as the familiar algebraic process of proving that $2 = 1$—all of which depend upon concealing some inaccuracy or other. The results obtained by perfectly correct processes are sufficiently bewildering.

In the following pages are explained several interesting arithmetical amusements and a number of curious numerical facts.

ARITHMETICAL TRICKS AND CURIOUS FACTS

TO TELL A NUMBER THOUGHT OF DESIRE any person to think of a number, say a certain number of cents; tell him to borrow that sum of some one in the company, and add the number borrowed to the amount thought of. It will here be proper to name the person who lends him the cents and to beg the one who makes the calculation to do it with great care, as he may readily fall into an error, especially the first time. Then, say to the person—"I do not lend you, but give you 10, add them to the former sum." Continue in this manner: "Give the half to the poor, and retain in your memory the other half." Then add: "Return to the gentleman, or lady, what you borrowed, and remember that the sum lent you was exactly equal to the number thought of." Ask the person if he knows exactly what remains. He will answer "Yes." You must then say—"And I know, also, the number that remains; it is equal to what I am going to conceal in my hand." Put into one of your hands five pieces of money, and desire the person to tell how many you have now. He will answer five; upon which open your hand, and show him the five pieces. You may then say—"I well knew that your result was five; but if you had thought of a very large number, for example, two or three millions, the result would have been much greater, but my hand would not have held a number of pieces equal to the remainder." The person then supposing that the result of the calculation must be different, according to the difference of the number thought of, will imagine that it is necessary to know the last number in order to guess the result: but this idea is false; for, in the case which we have here supposed, whatever be the number thought of, the remainder must always be five. The reason of this is as follows: The sum, the half of which is given to the poor, is nothing else than twice the number thought of, plus 10; and when the poor have received their part, there remains only the number thought of, plus 5;

but the number thought of is cut off when the sum borrowed is returned, and, consequently, there remains only 5.

It may be hence seen that the result may be easily known, since it will be half of the number given in the third part of the operation; for example, whatever be the number thought of, the remainder will be 36 or 25, according as 72 or 50 have been given. If this trick be performed several times successively, the number given in the third part of the operation must be always different; for if the result were several times the same, the deception might be discovered. When the first five parts of the calculation for obtaining a result are finished, it will be best not to name it at first, but to continue the operation, to render it more complex, by saying, for example: "Double the remainder, deduct 2, add 3, take the fourth part," etc.; and the different steps of the calculation may be kept in mind, in order to know how much the first result has been increased or diminished. This irregular process never fails to confound those who attempt to follow it.

A Second Method.—Bid the person take 1 from the number thought of, and then double the remainder; desire him to take 1 from the double, and to add to it the number thought of; in the last place, ask him the number arising from this addition, and, if you add 3 to it, the third of the sum will be the number thought of. The application of this rule is so easy, that it is needless to illustrate it by an example.

A Third Method.—Desire the person to add 1 to the triple of the number thought of, and to multiply the sum by 3; then bid him add to this product the number thought of, and the result will be a sum, from which, if 3 be subtracted, the remainder will be ten times the number required; and if the cipher on the right be cut off from the remainder, the other figure will indicate the number sought.

Example:—Let the number thought of be 6, the triple of which is 18; and if 1 be added, it makes 19; the triple of this last number is 57, and if 6 be added, it makes 63, from which, if 3 be subtracted, the remainder will be 60; now, if the cipher on the right be cut off, the remaining figure, 6, will be the number required.

A Fourth Method.—Bid the person multiply the number thought of by itself; then desire him to add 1 to the number thought of, and to multiply it also by itself; in the last place, ask him to tell the difference of these two products, which will certainly be an odd number, and the least half of it will be the number required. Let the number thought of, for example, be 10, which, multiplied by itself, gives 100; in the next place, 10 increased by 1 is 11, which, multiplied by itself, makes 121; and the difference of these two squares is 21, the least half of which, being 10, is the number thought of. This operation might be varied by desiring the person to multiply the second number by itself, after it has been diminished by 1. In this case, the number thought of will be equal to the greater half of the difference of the two squares. Thus, in the preceding example, the square of the number thought of is 100, and that of the same number less 1, is 81; the difference of these is 19; the greater half of which, or 10, is the number thought of.

TO TELL TWO OR MORE NUMBERS THOUGHT OF

If one or more of the numbers thought of be greater than 9, we must distinguish two cases; that in which the number or the numbers thought of is odd, and that in which it is even.

In the first case, ask the sum of the first and second, of the second and third, the third and fourth, and so on to the last, and then the sum of the first and the last. Having written down all these sums in order, add together all those, the places of which are odd, as the first, the third, the fifth, etc.; make another sum of all those, the places of which are even, as the second, the fourth, the sixth, etc., subtract this sum from the former, and the remainder will be the double of the first number. Let us suppose, for example, that the five following numbers are thought of, 3, 7, 13, 17, 20, which, when added two and two as above, give 10, 20, 30, 37, 23: the sum of the first, third, and fifth, is 63, and that of the second and fourth is 57; if 57 be subtracted from 63, the remainder, 6, will be the double of the first number, 3. Now, if 3 be taken from 10, the first of the sums, the remainder, 7, will be the second number, and by proceeding in this manner we may find all the rest.

In the second case, that is to say, if the number or the numbers thought of be even, you must ask and write down, as above, the sum of the first and second, that of the second and third, and so on, as before; but, instead of the sum of the first and last, you must take that of the second and last; then add together those which stand in the even places, and form them into a new sum apart; add also those in the odd places, the first

excepted, and subtract this sum from the former, the remainder will be the double of the second number; and if the second number, thus found, be subtracted from the sum of the first and second, you will have the first number; if it be taken from that of the second and third, it will give the third; and so of the rest. Let the numbers thought of be, for example, 3, 7, 13, 17; the sums formed as above are 10, 20, 30, 24, the sum of the second and fourth is 44, from which, if 30, the third, be subtracted, the remainder will be 14, the double of 7, the second number. The first, therefore, is 3, the third 13, and the fourth 17.

When each of the numbers thought of does not exceed 9, they may be easily found in the following manner:

Having made the person add 1 to the double of the first number thought of, desire him to multiply the whole by 5, and to add to the product the second number. If there be a third, make him double this first sum, and add 1 to it; after which, desire him to multiply the new sum by 5, and to add to it the third number. If there be a fourth, proceed in the same manner, desiring him to double the preceding sum, to add to it 1, to multiply by 5, to add the fourth number, and so on.

Then ask the number arising from the addition of the last number thought of, and if there were two numbers, subtract 5 from it; if there were three, 55; if there were four, 555; and so on, for the remainder will be composed of figures of which the first on the left will be the first number thought of, the next the second, and so on.

Suppose the number thought of to be 3, 4, 6; by adding 1 to 6, the double of the the first, we shall have 7, which, being multiplied by 5, will give 35; if 4, the second number thought of, be then added, we shall have 39, which, doubled, gives 78; and, if we add 1, and multiply 79, the sum, by 5, the result will be 395. In the last place, if we add 6, the number thought of, the sum will be 401; and if 55 be deducted from it, we shall have, for remainder, 346, the figures of which, 3, 4, 6, indicate in order the three numbers thought of.

THE MONEY GAME

A person having in one hand a piece of gold, and in the other a piece of silver, you may tell in which hand he has the gold, and in which the silver, by the following method: Some value, represented by an even number, such as 8, must be assigned to the gold; and a value represented by an odd number, such as 3, must be assigned to the silver; after which, desire the person to multiply the number in the right hand, by any even number whatever, such as 2; and that in the left hand by an odd number, as 3; then bid him add together the two products, and if the whole sum be odd, the gold will be in the right hand, and the silver in the left; if the sum be even, the contrary will be the case.

To conceal the artifice better, it will be sufficient to ask whether the sum of the two products can be halved without a remainder; for in that case the total will be even, and in the contrary case odd.

It may be readily seen that the pieces, instead of being in the two hands of the same person, may be supposed to be in the hands of two persons, one of whom has the even number, or piece of gold, and the other the odd number, or piece of silver. The same operations may then be performed in regard to these two persons as are performed in regard to the two hands of the same person, calling the one privately the right, and the other the left.

THE GAME OF THE RING

This game is an application of one of the methods employed to tell several numbers thought of, and ought to be performed in a company not exceeding nine, in order that it may be less complex. Desire any one of the company to take a ring, and put it on any joint of whatever finger he may think proper. The question then is, to tell what person has the ring, and on what hand, what finger, and on what joint.

For this purpose, you must call the first person 1, the second 2, the third 3, and so on. You must also denote the ten fingers of the two hands by the following numbers of the natural progression, 1, 2, 3, 4, 5, etc., beginning at the thumb of the right hand, and ending at that of the left, that this order of the number of the finger may, at the same time, indicate the hand. In the last place, the joints must be denoted by 1, 2, 3, beginning at the points of the fingers.

To render the solution of this problem more explicit, let us suppose that the fourth person in the company has the ring on the sixth finger, that is to say, on the little finger of the left hand, and on the second joint of that finger.

Desire some one to double the number expressing the person, which, in this case, will give 8; bid him add 6 to this double, and multiply the sum by 5, which will make 65; then tell him to add to this product the

number denoting the finger, that is to say 6, by which means you will have 71; and, in the last place, desire him to multiply the last number by 10, and to add to the product the number of the joint, 2; the last result will be 712; if from this number you deduct 250, the remainder will be 462; the first figure of which, on the left, will denote the person; the next, the finger, and, consequently, the hand; and the last, the joint.

It must here be observed, that when the last result contains a cipher, which would have happened in the present example had the number of the figure been 10, you must privately subtract from the figure preceding the cipher, and assign the value of 10 to the cipher itself.

HOW MANY DID EACH RECEIVE?

Here is a form of problem that the writer has found to puzzle children with, and their elders also: At a certain election 4,420 votes were cast. A received 1,300 more than B. How many votes did each receive?—SOLUTION. Had A and B each received the same number of votes it would be necessary only to divide 4,420 by 2. But, as A received 1,300 more votes than B, this latter number should be subtracted from 4,420, leaving a remainder of 3,120. As B's number of votes received was 1,300 less than A's, it is obvious that the remainder of 3,120 represents twice the number of votes that B received. Dividing 3,120, therefore, by 2, we have 1,560, or the number of votes that B received. Subtracting 1,560, B's number of votes, from 4,420, we have a remainder of 2,860, or A's vote. Adding 1,560 and 2,860 we find that the total is 4,420, while the difference between 2,860 and 1,560 is 1,300, which fulfils the conditions of the problem. Simple as this seems, it is certain to prove puzzling to most persons. Take the problem in another form. A and B received for certain work the sum of $1,624, but A was paid $332 more than B. How much did each receive? Subtracting $332 from $1,624 gives $1,292, and this divided by 2 gives $646 as B's share, while A's share must be $332 more. Any number of problems may be arranged and solved along these lines.

THE CERTAIN GAME

Two persons agree to take, alternately, numbers less than a given number, for example, 11, and to add them together till one of them has reached a certain sum, such as 100. By what means can one of them infallibly attain to that number before the other?

The whole artifice in this consists in immediately making choice of the numbers 1, 12, 23, 34, and so on, or of a series which continually increases by 11, up to 100. Let us suppose that the first person, who knows the game, makes choice of 1; it is evident that his adversary, as he must count less than 11, can at most reach 11, by adding 10 to it. The first will then take 1, which will make 12; and whatever number the second may add, the first will certainly win, provided he continually add the number which forms the complement of that of his adversary to 11; that is to say, if the latter take 8, he must take 3; if 9, he must take 2; and so on. By following this method he will infallibly attain to 89: and it will then be impossible for the second to prevent him from getting first to 100; for whatever number the second takes he can attain only to 99; after which the first may say—"and 1 makes 100." If the second take 1 after 89, it would make 90, and his adversary would finish by saying—"and 10 makes 100." Between two persons who are equally acquainted with the game, he who begins must necessarily win.

If your opponent have no knowledge of numbers, you may take any other number first, under 10, provided you subsequently take care to secure one of the last terms, 56, 67, 78, etc., or you may even let him begin, if you take care afterward to secure one of these numbers.

This exercise may be performed with other numbers; but, in order to succeed, you must divide the number to be attained by a number which is a unit greater than what you can take each time, and the remainder will then be the number you must first take. Suppose, for example, the number to be attained be 52, and that you are never to add more than 6; then, dividing 52 by 7, the remainder, which is 3, will be the number which you must first take; and whenever your opponent adds a number you must add as much to it as will make it equal to 7, the number by which you divided, and so in continuation.

A SURE WAY TO LEARN A PERSON'S AGE

Here is a little scheme which a mathematician has discovered to find out the age of any person.

Having engaged that person in pleasant conversation, you proceed something after the following manner—speaking very innocently, of course:

"There is a simple problem in arith-

metic which very few people are able to see through, yet it is as easy as possible. I wonder if you can't do it?" This sets a woman on her dignity, and she wants to do it at once.

"Think of a number corresponding to the numerical order of the month in which you were born. Oh, no, you need not tell me." (To make the explanation clear, we will assume that the figure is 2—standing for February—and that the age is thirty.) "Now multiply that figure by 2," you continue, "and add 5. Done that? Well, multiply that by 50, and add your own age. From the total subtract 365, and to the result add 115. Now what figure have you." "230," replies the person addressed. "Isn't that correct?" "Exact," you exclaim. "You are one of the very few persons who have managed it." And you turn away to hide your smile of satisfaction at having discovered that your victim was born in February, and that she is thirty years of age. You have arrived at this result by separating the figures 230 in 2 (February) and 30. And you can do this with everybody's age. Try it on your sweetheart.

PROPERTIES OF CERTAIN NUMBERS

Of Odd Numbers.—All the odd numbers above 3, that can only be divided by 1, can be divided by 6, by the addition or subtraction of a unit. For instance, 13 can only be divided by 1; but after deducting 1, the remainder can be divided by 6; for example, $5+1=6$; $7-1=6$; $17+1=18$; $19-1=18$; $25-1=24$, and so on.

Of Number Three.—Select any two numbers you please, and you will find that either one of the two, or their amount when added together, or their difference, is always 3, or a number divisible by 3. Thus, if the numbers are 3 and 8, the first number is 3; let the numbers be 1 and 2, their sum is 3; let them be 4 and 7, the difference is 3. Again, 15 and 22, the first number is divisible by 3; 17 and 26, their difference is divisible by 3, etc.

Of Number Five.—If you multiply 5 by itself, and the quotient again by itself, and the second quotient by itself, the last figure of each quotient will always be 5. Thus, $5\times5=25$; $25\times25=625$; $125\times125=15,625$, etc. Again, if you proceed in the same manner with the figure 6, the last figure will constantly be 6.

To divide any number by five, or any multiplicand of that number, by means of simple addition:—To divide by 5, double the number given, and mark off the last figure, which will represent tenths. Thus, to divide 261 by 5: $261+261=522$, or 52 2-10ths. Again, to divide the same number by 25, you must take four times the number to be divided, and mark off the last two figures, which will be hundredths, thus, $261+261+261+261=1,044$, or 10 44-100ths.

Of Number Nine.—The following remarkable properties of the number 9 are not generally known: Thus, $9\times1=9$; $9\times2=18$, $1+8=9$; $9\times3=27$, $2+7=9$, $9\times4=36$, $3+6=9$; $9\times5=45$, $4+5=9$; $9\times6=54$, $5+4=9$; $9\times7=63$, $6+3=9$; $9\times8=72$, $7+2=9$; $9\times9=81$, $8+1=9$.

It will be seen by the above that—1. The component figures of the product made by the multiplication of every digit into the number 9, when added together, make NINE. 2. The order of these component figures is reversed, after the said number has been multiplied by 5. 3. The component figures of the amount of the multipliers (viz. 45), when added together, make NINE. 4. The amount of the several products, or multiples of 9 (viz. 405), when divided by 9, gives, for a quotient, 45; that is, $4+5=$ NINE.

It is also observable that the number of changes that may be rung on nine bells is 362,880; which figures, added together, make 27; that is, $2+7=$ NINE.

And the quotient of 362,880, divided by 9, will be 40,320; that is, $4+0+3+2+0=$ NINE.

To add a figure to any given number, which shall render it divisible by Nine: Add the figures together in your mind, which compose the number named; and the figure which must be added to the sum produced, in order to render it divisible by 9, is the one required. Thus, suppose the given number to be 7,521:

Add those together, and 15 will be produced; now 15 requires 3 to render it divisible by 9; and that number 3, being added to 7,521, causes the same divisibility:

7,521
3

9)7,524(836

This exercise may be diversified by your specifying, before the sum is named, the particular place where the figure shall be inserted, to make the number divisible by 9; for it is exactly the same thing whether the figure be put at the head of the number, or between any two of its digits.

To multiply by Nine by Simple Subtraction.—Supposing you wish to multiply 67,583 by 9, add a cipher to the end of the sum, then place the sum to be divided underneath the amount, and subtract it from the same; the quotient will be the product of 67,583 multiplied by 9; thus:

675830
67583

608247

Number Nine and Eighteen.—If any two of the following sums, 36, 63, 81, 117, 126, 162, 207, 216, 252, 261, 306, 315, 360, 432, are added together, the figures in the quotient, when cast up, will make either 9 or 18. For instance, $216 + 252 = 468$, and $4 + 6 + 8 = 18$; or, $63 + 81 = 144$, and $1 + 4 + 4 = 9$.

THE UNITED DIGITS

The figures 1 to 9 may be placed in such order that the whole added together make exactly 100. Thus:

15
36
47

98
2

100

The secret is to arrange the figures 1, 3, 4, 5, 6, 7, in such a manner that, added together, they make 98, when by adding 2 you get the whole nine digits into the calculation.

TO DISCOVER A SQUARE NUMBER

A square number is a number produced by the multiplication of any number into itself; thus, 4 multiplied by 4 is equal to 16, and 16 is consequently a square number, 4 being the square root from which it springs. The extraction of the square root of any number takes some time; and after all your labor you may perhaps find that the number is not a square number. To save this trouble, it is worth knowing that every square number ends either with a 1, 4, 5, 6, or 9, or with two ciphers, preceded by one of these numbers.

Another property of a square number is, that if it be divided by 4, the remainder, if any, will be 1—thus, the square of 5 is 25, and 25 divided by 4 leaves a remainder of 1; and again 16, being a square number, can be divided by 4 without leaving a remainder.

A MAGIC SQUARE

The following arrangement of figures, from 1 to 36, in the form of a square, will amount to the same sum if the numbers are cast up perpendicularly, horizontally, or from corner to corner, the result in every direction being 111:

29	12	28	9	7	26
32	31	3	4	36	5
23	18	15	16	19	20
14	24	21	22	13	17
2	1	34	33	6	35
11	25	10	27	30	8

TO WEIGH FROM ONE TO FORTY POUNDS WITH FOUR WEIGHTS

To weigh any weight from 1 to 40 pounds by the use of four weights only, the weights must be respectively 1, 3, 9, and 27 pounds each. Thus, 2 pounds may be weighed by placing 3 pounds in one scale and 1 in the other; 5 pounds, by placing 1 and 3 in one scale and 9 pounds in the opposite, etc.

THE CANCELED FIGURE GUESSED

To tell the figure a person has struck out of the sum of two given numbers: Arbitrarily command those numbers only that are divisible by 9; such, for instance, as 36, 63, 81, 117, 126, 162, 261, 360, 315, and 432.

Then let a person choose any two of these numbers; and, after adding them together in his mind, strike out from the sum any one of the figures he pleases.

After he has so done, desire him to tell you the sum of the remaining figures; and it follows, that the number which you are obliged to add to this amount, in order to make it 9 or 18, is the one he struck out. Thus:

Suppose he chooses the numbers 162 and 261, making altogether 423, and that he strikes out the centre figure, the two other figures will, added together, make 7, which, to make 9, requires 2, the number struck out.

THE DICE GUESSED UNSEEN

A pair of dice being thrown, to find the number of points on each die without seeing them: Tell the person who cast the dice to double the number of points upon one of them, and add 5 to it; then to mul-

tiply the sum produced by 5, and to add to the product the number of points upon the other die. This being done, desire him to tell you the amount, and, having thrown out 25, the remainder will be a number consisting of two figures, the first of which, to the left, is the number of points on the first die, and the second figure, to the right, the number on the other. Thus:

Suppose the number of points on the first die which comes up to be 2, and that of the other 3; then, if to 4, the double of the points of the first, there be added 5, and the sum produced, 9, be multiplied by 5, the product will be 45; to which, if 3, the number of points on the other die, be added, 48 will be produced, from which, if 25 be subtracted, 23 will remain; the first figure of which is 2, the number of points on the first die, and the second figure 3, the number on the other.

THE SOVEREIGN AND THE SAGE

A sovereign being desirous to confer a liberal reward on one of his courtiers, who had performed some very important service, desired him to ask whatever he thought proper, assuring him it should be granted. The courtier, who was well acquainted with the science of numbers, only requested that the monarch would give him a quantity of wheat equal to that which would arise from one grain doubled sixty-three times successively. The value of the reward was immense; for it will be found that the sixty-fourth term of the double progression divided by 1, 2, 4, 8, 16, 32, etc., is 9,223,372,036,854,775,808. But the sum of all the terms of a double progression, beginning with 1, may be obtained by doubling the last term, and subtracting from it 1. The number of the grains of wheat, therefore, in the present case, will be 18,446,744,073,709,551,615. Now, if a pint contain 9,216 grains of wheat, a gallon will contain 73,728; and, as eight gallons make one bushel, if we divide the above result by eight times 73,728 we shall have 31,274,997,411,295 for the number of the bushels of wheat equal to the above number of grains, a quantity greater than what the whole surface of the earth could produce in several years, and which, in value, would exceed all the riches, perhaps, on the globe.

THE HORSE-DEALER'S BARGAIN

A gentleman taking a fancy to a horse, which a horse-dealer wished to dispose of at as high a price as he could, the latter, to induce the gentleman to become a purchaser, offered to let him have the horse for the value of the twenty-fourth nail in his shoes, reckoning one cent for the first nail, two for the second, four for the third, and so on to the twenty-fourth. The gentleman, thinking he should have a good bargain, accepted the offer; how mistaken he was the result will show.

By calculating as before, the twenty-fourth term of the progression, 1, 2, 4, 8, etc., will be found to be 8,388,608, equal to the number of cents the purchaser gave for the horse; the price, therefore, amounted to $83,886.08.

THE DINNER PARTY

A club of seven persons agreed to dine together every day successively, so long as they could sit down to table differently arranged. How many dinners would be necessary for that purpose? It may easily be found by the rules of simple progression, that the club must dine together 5,040 times before they would exhaust all the arrangements possible, which would require above thirteen years.

THE BASKET AND STONES

If a hundred stones be placed in a straight line, at the distance of a yard from each other, the first being at the same distance from a basket, how many yards must the person walk who engages to pick them up, one by one, and put them into the basket? It is evident that, to pick up the first stone and put it into a basket, the person must walk two yards; for the second, he must walk four; for the third, six; and so on, increasing by two to the hundredth.

The number of yards, therefore, which the person must walk will be equal to the sum of the progression, 2, 4, 6, etc., the last term of which is 200 (22). But the sum of the progression is equal to 202, the sum of the two extremes, multiplied by 50, or half the number of terms; that is to say, 10,100 yards, which makes more than 5½ miles.

THE CAN OF ALE

How to divide 8 gallons of ale contained in an 8-gallon can into two equal parts, having only two empty bottles to effect it with, one containing 5 gallons and the other 3. First, fill the 5-gallon bottle, and you will have 3 remaining in the 8-gallon can; fill the 3-gallon bottle from the 5-gallon, which will then contain only 2 gallons; pour the 3 gallons in the 3-gallon bottle into that which holds 8 gallons, which will then contain 6 gallons; then pour the 2 gallons

out of the 5-gallon bottle into the 3-gallon bottle, and filling the 5-gallon bottle from the 8-gallon can, which at present contains 6 gallons, you will have 1 gallon in the can, 5 in the largest bottle, and 2 in the smallest; by filling up the 3-gallon can from the 5-gallon, you leave 4 gallons, or one-half the 8 gallons, in the largest bottle; and, lastly, pouring the contents of the 3-gallon bottle into the 8-gallon can, which contains 1 gallon, you have the second half, or 4 gallons.

COUNTING A BILLION

What is a billion? The reply is very simple—a thousand times a million. This is quickly written, and more quickly still pronounced. But no man is able to count it. You can count 160 or 170 a minute; but let us even suppose that you go as far as 200 in a minute, then an hour will produce 12,000; a day, 288,000; and a year, or 365 days (for every four years you may rest from counting during leap year), 105,120,000. Let us suppose, now, that Adam, at the beginning of his existence, had begun to count, had continued to do so, and was counting still, he would not, even now, according to the usually supposed age of our globe, have counted nearly enough. For, to count a billion, he would require 9,512 years, 34 days, 5 hours, and 20 minutes, according to the above rule.

THE NUMBER SEVENTY-THREE

If number 73 be multiplied by any of the progressive numbers arising from the multiplication of 3 with any of the units, the result will be as follows:

$$\begin{aligned}
73 \times 3 &= 219 \\
73 \times 6 &= 438 \\
73 \times 9 &= 657 \\
73 \times 12 &= 876 \\
73 \times 15 &= 1095 \\
73 \times 18 &= 1314 \\
73 \times 21 &= 1533 \\
73 \times 24 &= 1752 \\
73 \times 27 &= 1971
\end{aligned}$$

On inspecting these amounts it will be seen that the last figures run thus—9, 8, 7, 6, 5, 4, 3, 2, 1. Again, if we refer to the sums produced by the multiplication of 73 by 3, 6, 9, 12, and 15, it will be found that by reading the two figures to the left of each amount backward, it will give 1, 2, 3, 4, 5, 6, 7, 8, 9, 0.

CURIOUS CALCULATION

If a pin were dropped into the hold of the big freighter *Pennsylvania*, and on that day week a second pin, and on that day week four pins, and so on, doubling the number of pins each week for a year, there would, by the end of the 52 weeks, be deposited no fewer than 4,503,599,627,370,495 pins. Allowing 200 to the ounce, the weight of the whole would be 628,292,358 tons; and to carry them all would require 52,358 ships as large as the *Pennsylvania*, which is calculated to carry 12,000 tons of freight.

ARITHMETICAL PROGRESSION

If you could buy a hundred ships, giving a farthing for the first, a halfpenny for the second, a penny for the third, twopence for the fourth, and so on to the last, doubling the sum each time, the whole amount paid would be £557,750,707,053,344,041,463,074,442 18s. 7¾d.—a sum which in words runs thus: 557 quadrillions, 750,707 trillions, 53,344 billions, 41,643 millions, 74 thousand, 442 pounds, eighteen shillings and sevenpence three farthings. This amount in sovereigns would weigh 3,557,083,590,327,499,123,418 tons. Then, counting $4.84 to the pound, 24 cents to the shilling, and 2 cents to the penny, this sum would equal in United States money no less than $2,819,303,422,138,185,160,681,280,303.75½, which seems to make our fleet quite expensive.

QUEER PROPERTIES OF FORTY-FIVE

Divide 45 into four such parts that by adding 2 to the first you will have 10; by subtracting 2 from the second you will have 10; by multiplying the third by 2 you will have 10; by dividing the fourth by 2 you will have 10. The four parts are as follows:

$$\begin{aligned}
(1)\quad & 8 + 2 = 10 \\
(2)\quad & 12 - 2 = 10 \\
(3)\quad & 5 \times 2 = 10 \\
(4)\quad & 20 \div 2 = 10 \\
& 8 + 12 + 5 + 20 = 45
\end{aligned}$$

Subtract 45 from 45 and leave 45 as a remainder. As may be readily discovered,

$$45 = 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1.$$

Then, writing these numbers consecutively, we have:

$$\begin{array}{r} 987654321 \\ 123456789 \\ \hline 864197532 \end{array}$$

Then, as is evident,

$$8 + 6 + 4 + 1 + 9 + 7 + 5 + 3 + 2 = 45.$$

CURIOUS ARITHMETICAL RESULTS

$123456789 \times 9 + 10 = 1111111111$
$123456789 \times 18 + 20 = 2222222222$
$123456789 \times 27 + 30 = 3333333333$
$123456789 \times 36 + 40 = 4444444444$
$123456789 \times 45 + 50 = 5555555555$
$123456789 \times 54 + 60 = 6666666666$
$123456789 \times 63 + 70 = 7777777777$
$123456789 \times 72 + 80 = 8888888888$
$123456789 \times 81 + 90 = 9999999999$

This table is still more interesting when it is noticed that each multiplier is divisible by 9, and that, when the figures of each answer are added together and the added number is subtracted, the answer is 0. For example, the sum of 1,111,111,111 is 10; 10 minus 10 is 0.

$1 \times 9 + 2 = 11$
$12 \times 9 + 3 = 111$
$123 \times 9 + 4 = 1111$
$1234 \times 9 + 5 = 11111$
$12345 \times 9 + 6 = 111111$
$123456 \times 9 + 7 = 1111111$
$1234567 \times 9 + 8 = 11111111$
$12345678 \times 9 + 9 = 111111111$

$1 \times 8 + 1 = 9$
$12 \times 8 + 2 = 98$
$123 \times 8 + 3 = 987$
$1234 \times 8 + 4 = 9876$
$12345 \times 8 + 5 = 98765$
$123456 \times 8 + 6 = 987654$
$1234567 \times 8 + 7 = 9876543$
$12345678 \times 8 + 8 = 98765432$
$123456789 \times 8 + 9 = 987654321$

OUTLINES OF LAW
ON EVERY-DAY MATTERS

WHILE, according to an old and eminently true saying, "a man who is his own lawyer has a fool for a client," it is in very many senses desirable that every one should understand at least the outlines of legal principles, as they define his personal rights and liabilities and prescribe his duties. For the purpose of giving this information, the following compilation of legal principles, as recognized in most of the United States, has been prepared. It can not be pretended that any one can derive exact information here, or that he would be justified, after studying these pages, in shaping his conduct in important matters, without the advice of an accredited attorney. He may learn sufficient, however, to guide and inform him on the general points of his rights, and thus save himself much of the worry—money, even—that is too often expended because one listens to idle threats and "old wives' tales," instead of seeking authoritative advice, when it is required.

It may seem to the average mind that the Law, using the term in a general sense, is a most involved, uncertain and altogether fantastic subject, invented solely for the confusion of the majority and for the profit of lawyers. Such a person can not understand why it is not possible to have a few well-defined and simple principles, like the Ten Commandments, and base all suits and judgments upon questions whether or no these have been violated. Such an arrangement would undoubtedly have some advantages, provided (1) any authority were capable of formulating such a code for our civilization, and (2) that it were possible to provide against the misunderstanding, misconstruction, and misapplication of even the simplest and most inclusive statutes.

The Law as we have it in the United States is in the larger majority of cases an outgrowth and development of that vast body of tradition and precedent known as the Common Law of England. Many of the principles of the Common Law, as codified by Blackstone in the seventeenth century, are derived direct from the ecclesiastical laws that formerly held, when Church authorities administered nearly all the courts, civil and criminal. Superposed upon these is another vast body of material, composed of judicial decisions on all kinds of cases, ranging through several centuries. This second body of authority is called "precedent," and marks a fairly steady progress away from the old Church Laws of the Middle Ages. In

several of the United States Common-Law principles still hold good in a number of matters, but the tendency is to modify them by statute in other particulars. Thus it is that there is such a wide divergence in such subjects as divorce, inheritance, criminal jurisprudence, etc., in the various States. Wherever a point is not covered by special statute or is not defined in the code of procedure—if there be one—it is still judged with reference to the Common Law.

DIGEST OF LAWS ON FAMILIAR SUBJECTS

AGENCY

BY AGENCY is meant the substitution of one person by and for another, the former to transact business for the latter. An Agency may be established by *implication*—an express agreement with a person that he is to become the agent of another, not being necessary—or *verbally*, or by *writing*. A verbal creation of agency suffices to authorize the agent to make a contract even in cases where such contract must be in writing.

Agency is of three kinds; special, general, and professional. A special agency is an authority exercised for a special purpose. If a special agent exceed the limits of his authority, his principal is not bound by his acts.

A general agency authorizes the transaction of all business of a particular kind, or growing out of a particular employment. The principal will be bound by the acts of a general agent though the latter act contrary to *private* instructions, provided he keep, at the same time, within the general limits of his authority.

Professional agents are those licensed by the proper authority to transact certain kinds of business for a compensation. The following are among this kind of agents:

1. Attorneys. 2. Brokers. 3. Factors. 4. Auctioneers. 5. Masters of Ships.

A person doing business as an agent in New York State must file with the County Clerk a certificate giving name and address of principal.

In regard to the subject of an agency, the general rule is that whatever a man may do in his own right, he may also transact through another.

Infants, lunatics, idiots, aliens, belligerents, and persons incapable of making legal contracts, can not act as principals in the appointment of agents. Infants may, however, become principals in certain cases, and married women may become principals the same as men.

Agency may be terminated in two ways: (1) by the act of the principal or agent; (2) by operation of law. In the latter case, the termination of the agency is effected by lapse of time, by completion of the subject matter of the agency, by the extinction of the subject matter, or by the insanity, bankruptcy, or death of either party.

ARBITRATION

Arbitration is an investigation and determination of subjects of difference between persons involved in dispute, by unofficial persons chosen by the parties in question.

The general rule is that any person capable of making a valid contract concerning the subject in dispute may be a party to an arbitration. Any matter which the parties may adjust by agreement, or which may be made the subject of a suit at law, may be determined by arbitration. Crimes can not be made the subject matter of an arbitration.

Questions may be submitted for arbitration in the following ways:

1. By *parol.*
2. By *writing.*
3. *Under the statute,* which must be done if the parties are desirous of availing themselves of its provisions.
4. *By rule of court,* which occurs when an action is pending in court and the parties agree to take it before arbitrators, in accordance with an order of the court.
5. *By deposit of notes.*

A person may be selected as arbitrator, notwithstanding his natural incapacity or legal disability to make contracts.

The arbitrators must fix the time and place of hearing, and give due notice of the same to the parties. They must be sworn, if the statute requires an oath, unless such

oath is waived by the parties themselves. In the matter of hearing evidence the statute of the State must be followed.

The arbitrators may adjourn from time to time, provided the time does not extend beyond the period appointed for the delivery of the award.

In arbitrations the parties are entitled to the aid of *counsel*, the same as they would be in court.

After a fair submission and a legal award, the matter submitted can not be litigated on, any more than if it had been settled by a judgment.

An award may be impeached where it has been procured by corruption, fraud, or other undue means; by misconduct, corruption, or irregularity on the part of the arbitrators; when the arbitrators acknowledge they have made a mistake in their decision; where the arbitrators have exceeded their powers; where pertinent and material evidence was rejected, etc. If either party revokes the submission, he will be liable for an action for breach of contract, and the payment of damages by the other party.

ARREST

The defendant in an action may be arrested for the following causes, when the action is to recover damages:

1. Personal injury.

2. Injury to property, including wrongful taking, detention, or conversion of property.

3. Breach of promise to marry.

4. Fraud or deceit.

5. Misconduct or neglect in office, or in professional employment.

6. In an action to recover a chattel where said chattel or a part thereof has been removed, concealed, or disposed of, so that it can not be found or be taken by the Sheriff, and with intent that it should not be found or taken by the Sheriff, or with the intent of depriving the plaintiff of the benefit thereof.

7. In an action upon contract, express or implied, other than a promise to marry, where the defendant has been guilty of fraud in contracting or incurring the liability.

8. In an action upon contract, either express or implied, other than a promise to marry, where defendant has, since the making of the contract, or in contemplation of the same, removed or disposed of his property with the intent of defrauding his creditors, or where he is about to remove or dispose of the same with like intent.

9. In case of action to recover for money received, or to recover property or damages for the conversion or misapplication of the same, where the money was received, or where the property was embezzled, or fraudulently misapplied by a public official, or by an attorney, solicitor, or counsellor, or by an officer or agent of a corporation or banking association in the course of his employment, or by a factor, agent, broker, or any person in a fiduciary capacity.

10. In an action wherein the judgment demanded requires the performance of an act, the neglect or the refusal to perform which would be punishable by the court as contempt, or where the defendant, not being a resident of the State, or being a resident, is about to depart from the State, by reason of which departure there is a danger that a judgment or an order requiring the performance of the said act will be rendered ineffectual.

Females are liable to arrest only in the cases mentioned in the preceding subdivision, or in cases of wilful injury to person, character, or property.

A debtor may be arrested in New York State only when it can be proved that he employed fraud in contracting the debt, or that he concealed or put his property out of his hands with the intent of defeating his creditors.

The defendant, when arrested, may give bail.

ATTACHMENT

An attachment may be issued, when it is a question of recovering a sum of money, for damages, in the following cases:

1. For breach of contract, whether express or implied, other than a contract to marry.

2. For wrongful conversion of personal property, or for any injury to personal property, in consequence of fraud, negligence, or any other wrong act.

The plaintiff must prove that a cause of action exists under one of the above heads before he is entitled to a warrant of attachment. In case of an action to recover damages, his affidavit must show that he is entitled to recover a sum therein stated over and above any or all counter claims against him. In addition, he must show that the defendant is either a foreign corporation or a non-resident of this State, or in case he is an individual person and resides in the State, that he has departed therefrom with the intention of defrauding his creditors, or avoiding being served with a summons, or that he keeps himself concealed within the

State with like intent. If the defendant is a natural person or a domestic corporation, the affidavit must show that he or it has removed his or its property from the State with the intention of defrauding his or its creditors, or that he has assigned, disposed of, or secreted his property, or that he is about to do so with like intent. The plaintiff must also give a bond or undertaking to the amount of two hundred and fifty dollars before the attachment issues. Salary or wages may be attached provided the conditions already mentioned exist for so doing. In the absence of said conditions, and after unsatisfied judgment and execution, wages may be taken by supplementary proceedings. The earnings of the debtor for his personal services for sixty days previous to the institution of said supplementary proceedings, where such earnings appear to be necessary for the support of a family wholly or in part supported by his labor, can not be reached.

BIRTHS AND DEATHS

All marriages, births, and deaths are required by law to be recorded, within a given time.

Of these the death record is the only one, as a rule, that is kept with measurable accuracy. The authorities are extremely careful that no body be interred without special permission, and due certificate as to death, cause of death, etc. Births are only partially reported, and though failure to report the fact to the Board of Statistics by one or all of those present at the birth is punishable under the law as a misdemeanor, the authorities, in many of our cities, wink at such delinquencies, although it is on record that fines have been imposed on physicians and others for violation of the code in this regard. But burial permits, procured for the removal of the body of the deceased person, can only be granted and signed by the Register of Records. No permits can be procured without a proper certificate from the physician who attended the case. In the event of sudden, violent, or suspicious death, whether with or without the attendance of a physician, the Coroner steps in and subpœnas a "properly qualified physician," to view the body of the deceased person, or, if necessary, to make an autopsy thereon.

No master of a ferryboat or public conveyance may carry the body of a deceased person without presentation of the death certificate, duly signed. and the same rule applies to those in charge of the burial ground.

The statistics cover every detail, regarding the various diseases causing death, the times and the seasons in which death occurs; and in the case of birth, the parentage, whether native or foreign born, black, white, or parti-colored, together with the place of birth, the father and mother's names, the mother's maiden name, the birthplace (County or State) of the father and mother, their age and occupation, the number of the child, whether first, second, etc. New York is less accurate in its birth returns than any other city in the Union, only sixty-five per cent of the births being reported. Massachusetts is the most exacting and accurate of any of the States in the matter of the registering of births.

CHATTEL MORTGAGES

A mortgage of goods and chattels will be void to creditors of the mortgagee, if the following conditions are not complied with:

1. The immediate delivery of the property accompanying the mortgage, followed by actual and continued claim of possession.

2. The filing of the mortgage, or a true copy thereof, as required by law, in the clerk's or register's office of the town, city or county where the mortgagor resides, and where the property lies at the time the instrument was executed. The mortgage must be filed where the mortgagee resides, if he is a resident of the State; if not, it must be filed in the city or town where the property is located at the time of the execution of the mortgage. It must be filed in the Register's Office in the cities of New York and Brooklyn.

CONTRACTS

The conditions of a contract, as applying to individuals, are: 1. Age; 2. Rationality; and 3, as to Corporations, the possession of general or special statutory powers.

Persons under age are incompetent to make contracts, except under certain limitations. Generally such persons are incapable of making binding contracts.

As to rationality, the general principle of law is that all persons not rendered incompetent by personal disability, or by considerations of public policy, are capable of making a contract.

Corporations have powers to make contracts strictly within the limits prescribed by their charters, or by special or general

statute. The following classes of contracts are void, unless they shall be in writing and subscribed by the party to be charged thereby:

1. Every agreement that by its terms is not to be performed within one year from the making thereof.

2. Every special promise to answer for the debt, default, or miscarriage of another person.

3. Every agreement, promise or undertaking, made upon consideration of marriage, except mutual promises to marry.

4. Every contract for the leasing of a longer period than one year, or for the sale of any lands, or any interest in lands, shall be void, unless the contract, or some note or memorandum thereof, expressing the consideration, be in writing and subscribed by the party by whom the lease or sale is made.

Every contract for the sale of any goods, chattels, or things in action shall be void, unless,

1. A note or memorandum of such contract be made in writing, and be subscribed by the parties to be charged thereby; or,

2. Unless the buyer shall accept and receive part of such goods, or the evidences, or some of them, of such things in action; or,

3. Unless the buyer shall, at the time, pay some part of the purchase money.

CORPORATIONS

Corporations are bodies created by law, which consist of individuals united under a common name, whose members succeed each other, so that the body continues the same, notwithstanding the change of the individuals who compose it.

Three or more persons so desiring may form a corporation.

The persons desiring to form a corporation must make a certificate in writing and acknowledge the same before an officer empowered to take the acknowledgment of deeds, in accordance with the direction required by law.

A duplicate of this certificate must be filed in the office of the Secretary of State.

The stockholders of the incorporated company are individually liable to the company's creditors to the amount of the stock held by them respectively, until all the capital stock shall have been paid in, and until a certificate stating the amount of the capital fixed and paid in shall be filed in the office of the County Clerk, in accordance with the requirements of the law. The stockholders are jointly and severally individually liable to the laborers or servants of the corporation for work performed for the same.

Corporations are liable for contracts made by the duly authorized agent within the scope of his authority, as well as for trespasses or torts committed by such agents under authority of such corporations.

Corporations are liable for negligence or breach of duty the same as individuals.

Corporations are liable to pay taxes in the same manner as individual owners of property.

Corporations are likewise subject to *visitation*, which consists of an authority to inspect the actions and regulate the behavior of the members who share in the franchise.

ESTATES: ADMINISTRATION OF

Administration is the legal right to settle and control the estate of deceased persons, as also the exercise of that right. Letters of administration are the warrant under the seal of the court granting the legal right.

The estate of a person who has died leaving no valid will behind him, is distributed among his heirs by what is called "the operation of law." This is regulated by the statutes of the State in which the deceased resided at the time of his death. The distribution is made by an administrator duly appointed by law, and who is appointed by the court having jurisdiction in such cases on being satisfied that the person is legally qualified. The appointment must be made with the consent of the person appointed. It is generally accepted as a rule that any one is legally competent to be an administrator who is legally competent to make a contract. Certain classes of persons are disqualified by statute, as, in the State of New York, drunkards, gamblers, spendthrifts, and so forth. The relatives of the deceased are considered as entitled to the appointment of administering the estate. The order of precedence is regulated by statute. Administration is to be granted to the husband on the wife's personal estate, and administration on the husband's estate is to be granted to the widow and the next of kin in the following order, provided they will accept:

1. To the surviving husband or wife.
2. To the children.
3. To the father.
4. To the mother.
5. To the brothers.
6. To the sisters.

7. To the grandchildren.

8. To any other of the next of kin who would be entitled to a share in the distribution of the estate.

The guardians of minors who are entitled may administer for them.

Should none of the relations or guardians accept, the administration will be given to the creditors of the deceased. The creditor applying first, provided he be legally competent, is to be preferred. In case no creditor applies, any person who is legally qualified may be appointed.

In the city of New York, the public administrator may administer the estate after the next of kin. In the State of New York, the surrogate may select, among the next of kin, any one in equal degree, and appoint him sole administrator to the exclusion of the others. Where there are several persons of the same degree of kindred to the intestate, entitled to administration, they are preferred in the following order:

1. Men to women.

2. Relatives of the whole blood to those of the half blood.

3. Unmarried to married women, and in case there be several persons equally entitled, the Surrogate may grant letters to one or more of them as he may judge best.

Letters of administration unduly granted may be revoked.

Administration may also be granted on certain conditions, for a certain limited time, or for a special purpose.

The powers and duties of an administrator differ from those of an executor inasmuch as he is bound to distribute and dispose of the estate according to the direction of the law, as he has no will to follow.

First.—The administrator must give bonds with sureties for the faithful administration of his trust.

Second.—He must make an inventory of the goods and chattels of the intestate, in accordance with the requirements of the law.

Third.—Two copies of said inventory shall be made, one of which will be lodged with the judge of the court, and the other will be kept by the administrator. The latter will be obliged to account for the property mentioned in the inventory.

Fourth.—The inventory completed, the administrator must then collect the outstanding debts of the same, and follow the order of payment, as regulated by the local statutes.

All the debts of the intestate being liquidated, the administrator will divide the remainder of the assets among the surviving relatives of the deceased. In doing this he will act under the directions of the court.

Letters of administration are of three kinds: first, upon the goods, chattels, and credits of a person who shall have died intestate, as considered above; second, special letters of administration authorizing the administrator to collect and preserve the estate either of a testator in certain cases, or of an intestate; and lastly, letters of administration authorizing the person appointed to execute the powers given by will of the deceased, called letters of administration, with the will annexed.

The last named is granted when there are no persons named as executors in the will; when all the executors named shall have renounced, or shall be legally incompetent; or after testamentary letters shall have superseded or revoked.

When a man having a family shall die leaving a widow, or a minor child or children, or a widow shall die leaving a minor child or children, the following articles shall not be deemed assets, for the purpose of distribution, the payment of debts or legacies, but shall be included and stated in the inventory of the estate without being appraised.

I. All spinning wheels, weaving looms, one knitting machine, one sewing machine, and stores put up and kept for use in the family.

II. The family Bible, family pictures, and school books used by or in the family of such deceased person, and books not exceeding in value fifty dollars, which were kept and used as part of the family library before the decease of such person.

III. All sheep to the number of ten, with their fleeces, and the yarn and cloth manufactured from the same; one cow, two swine, and the pork of such swine, and necessary food for such swine, sheep or cow for sixty days; and all necessary provisions, and fuel for such widow, or child, or children, for sixty days after the death of such deceased person.

IV. All necessary wearing apparel, beds, bedsteads, and bedding; necessary cooking utensils; the clothing of the family; the clothes of the widow, and her ornaments proper for her station; one table, six chairs, twelve knives and forks, twelve plates, twelve teacups and saucers, one sugar-dish, one milk-pot, and teapot and twelve spoons, and also other household furniture which

shall not exceed one hundred and fifty dollars in value.

V. Other necessary household furniture, provisions, or other personal property, in the discretion of the appraisers, to a value not exceeding one hundred and fifty dollars.

All articles and property set apart, in accordance with law for the benefit of a widow and a minor or minors, shall be and remain the sole personal property of such widow, after such minor or minors shall have arrived at age.

The executor or administrator, pending the final settlement of accounts, should not suffer any considerable balances to lie unproductive. When real securities are not to be had, he should obtain the approval of the surrogate as to the investment.

Reasonable funeral expenses are to be paid in preference to any debts, and are charged as expenses of administration.

ESTATES: DISTRIBUTION OF

When the deceased shall have died intestate, the surplus of his personal estate remaining after payment of debts, and where the deceased left a will, the surplus remaining after the payment of debts and legacies, if not bequeathed, shall be distributed to the widow, children, or next of kin of the deceased in the manner following:

1. One-third part thereof to the widow, and all the residue of equal portions, among the children, and such persons as legally represent such children, if any of them shall have died before the deceased.

2. If there be no children, nor any legal representatives of them, then one moiety (that is, one-half) of the whole surplus shall be allotted to the widow, and the other moiety shall be distributed to the next of kin of the deceased.

3. If the deceased leave a widow, and no descendant, parent, brother or sister, nephew or niece, the widow shall be entitled to the whole surplus; but if there be a brother or sister, nephew or niece, and no descendant or parent, the widow shall be entitled to a moiety of the surplus, and to the whole of the residue where it does not exceed two thousand dollars; if the residue exceed that sum, she shall receive in addition to her moiety two thousand dollars, and the remainder shall be distributed to the brothers and sisters and their representatives.

4. If there be no widow, then the whole surplus shall be distributed equally to and among the children, and such as legally represent them.

5. In case there be no widow, and no children, and no representatives of a child, then the whole surplus shall be distributed to the next of kin, in equal degree to the deceased, and the legal representatives.

6. If the deceased shall leave no children, and no representatives of them, and no father, and shall leave a widow and a mother, the moiety not distributed to the widow shall be distributed in equal shares to his mother, and brothers and sisters, or the representatives of such brothers and sisters; and if there be no widow, the whole surplus shall be distributed in like manner to the mother and to the brothers and sisters, or the representatives of such brothers and sisters.

7. If the deceased leave a father, and no child or descendant, the father shall take a moiety, if there be a widow, and the whole if there be no widow.

8. If the deceased leave a mother, and no child, descendant, father, brother, sister or representatives of a brother or sister, the mother, if there be a widow, shall take a moiety, and the whole if there be no widow.

9. When the descendants or next of kin of the deceased, entitled to share in his estate, shall be all in equal degree to the deceased, their shares shall be equal.

10. When such descendants, or next of kin shall be of unequal degrees of kindred, the surplus shall be apportioned among those entitled thereto, according to their respective stocks; so that those who take in their own right, shall receive equal shares, and those who take by representation shall receive the shares to which the parent whom they represent, if living, would have been entitled.

11. No representation shall be admitted among collaterals after brothers' and sisters' children.

12. Relations of the half blood shall take equally with those of the whole blood, in the same degree, and representatives of such relations shall take in the same manner as the representatives of the whole blood.

13. Descendants and next of kin of the deceased begotten before his death, but born thereafter, shall take in the same manner as if they had been born in the lifetime of the deceased, and had survived.

These provisions apply to the personal estate of married women who die intestate, leaving descendants; and the husband of any deceased married woman may demand, recover, and enjoy the same distributive

share in her personal estate that she, if a widow, would be entitled to in his personal estate, but no more.

The real property of every person dying intestate shall descend as follows:

1. To his lineal descendants.
2. To his father.
3. To his mother.
4. To his collateral relatives.

Should the inheritance come to the intestate on the part of the mother, the father does not take if the mother be living; and, in such a case, if she be dead, the father takes a life interest only, unless all the brothers and sisters of the deceased and their descendants be dead, or unless the deceased had no brothers or sisters, in which case the father is entitled to take the fee.

In case there is no father or mother, and the inheritance came to the deceased on the part of the mother, it will descend to the collateral relatives of the mother in preference to those of the father.

In case there is no father or mother, and ceased on the part of neither father nor mother, it will descend to the collateral relatives of both in equal shares.

Relatives of the half blood inherit equally with those of the whole blood in the same degree.

The mother of an illegitimate child, dying without any descendants, takes the inheritance.

In addition to the provisions in favor of the widow and the minor children from the personal estate of her husband, it is provided that she may tarry in the house of her husband forty days after his death, whether her dower be sooner assigned or not, without being liable to rent for the same, and meantime she shall have her reasonable sustenance off the estate of her husband. This sustenance shall be provided out of the personal property of her husband, and through the executor or administrator, should one be appointed prior to the expiration of the forty days, and shall be given according to the circumstances and station of life of the family, to the widow and children dependent on her. In providing this sustenance, the executor or administrator may exercise judgment and discretion, as he should in paying funeral expenses.

ESTATES: DOWER OF WIDOW

Dower is the estate which the widow of a deceased person takes in the lands of her husband, being a life estate in one-third of the lands whereof he was seized of an estate of inheritance at any time during the marriage.

A widow can be barred of her dower by her own act only, such as by uniting with her husband, in conveying the land by antenuptial settlement, by acceptance of a devise or bequest, in lieu of a dower, or by conjugal unfaithfulness; but to make this last effectual a divorce should be decreed against her for adultery, in the lifetime of her husband.

The widow of an alien entitled to hold real estate, if an inhabitant of this State at the time of his death, is entitled to dower in the same manner as if such alien had been a native citizen.

Any woman, being an alien, who has heretofore married, or who may hereafter marry a citizen of the United States, shall be entitled to dower, within this State to the same extent as if a citizen of the United States.

There are some restrictions to this general rule, as if a husband exchanges lands, the wife not uniting in the conveyance completing the exchange, she shall not be entitled to dower in both but shall make her election, and if she shall not begin proceedings to recover her dower in the land given in exchange, within a year following the death of her husband she shall be considered as having elected to take her dower in the lands received in exchange. Where a person mortgages his lands before his marriage, his widow shall not be entitled to dower, as against the mortgagee, or those claiming under him, but she shall be entitled to dower against everybody else.

When a husband executes a mortgage for purchase money, the widow will not be entitled to dower, as against the mortgagee, or those claiming under him, but shall be entitled, as against all other persons, and if the lands so mortgaged be sold under such mortgage, she will be entitled to dower in any surplus remaining after payment of the mortgage, and costs and expenses of sale, and she shall be entitled to the interest or income of one-third of such surplus during life.

A wife may cut off her incolate dower, by uniting in the conveyance of land with her husband during the marriage, or before her marriage by consenting to receive a settlement, either in lands or money, as a jointure or provision in lieu of dower.

Any widow who shall not have her dower assigned to her within forty days after the decease of her husband, may apply for ad-

measurement of her dower to the proper court, specifying therein the lands to which she claims dower.

ESTATES: LAWS ON WILLS

All persons of sound mind and of proper age are capable of disposing of their property by last will and testament. In some of the States minors may bequeath personal property. The limitation for disposing of personal estate by will is eighteen years for males and sixteen for females.

A will must be made in writing and subscribed with the testator's name, unless the person be prevented from so doing by the extremity of his last illness, in which case his name may be signed in his presence, and by his express direction. But in such a case the statute requires that the writer shall also affix his own name as a witness, or incur a penalty of fifty dollars.

A will requires at least two attesting witnesses.

The form of a will is not material, provided it manifests, in a sufficiently clear manner, the intention of the testator. He may put it in any language he may choose.

A will may be revoked at any time by the testator.

It may be revoked as follows:

First.—By subsequent instrument. A second will nullifies a former will, providing it contains words expressly revoking it, or that it makes a different and incompatible disposition of the property.

Second.—By the destruction of the will.

Third.—By marriage. Marriage, and the birth of a child, after the execution of a will, is a presumptive revocation of such will, provided wife and child are left unprovided for.

An unmarried woman's will is annulled by her marriage. She may make a deed of settlement of her estate, however, before marriage, empowering her to retain the right to make a will after marriage.

Children born after the execution of the will, and in the lifetime of the father, will inherit at the death of the testator in the same manner as if he had died without making a will.

Fourth.—By alteration of estate. Any alteration of the estate or interest of the testator in the property devised, implies a revocation of the will.

A sale of the devised property, or a valid agreement to sell it, is a legal revocation of such will.

A codicil, so far as it may be inconsistent with the will, works a revocation.

A subsequent will, duly executed, revokes all former wills, though no words to that effect may be used.

Property can not be devised to corporations, unless such corporations are expressly authorized to receive bequests by their charters.

A will should not be written by a legatee or devisee, nor should either of them, or an executor, or any one interested in the will be called upon to witness such will.

Married women are now enabled to devise real estate in the same manner and with the like effect as if they were unmarried.

And no person having a husband, wife, child or parent shall, by his or her last will and testament, devise or bequeath to any benevolent, charitable, literary, scientific, religious, or missionary society, association or corporation, in trust or otherwise, more than one-half part of his or her estate, after the payment of his or her debts, and any such devise or bequest shall be valid to the extent of one-half and no more.

Every citizen of the United States may take lands by devise.

And any person may take personal property by bequest under any will, except a witness thereto.

INTEREST AND USURY

Interest is a *moderate* profit for the use of money. In the different States the rate of interest is established by statute. In New York State six per cent is the legal rate of interest. Any excess over this, whether received directly or indirectly, will render the contract void, and is a misdemeanor, punishable by a fine not exceeding $1,000 or by imprisonment not exceeding six months, or both. An excess of interest above the legal rate may be recovered by an action at law, if brought in one year from the time of payment.

Corporations can not set up the defence of usury.

In case promissory notes and bills of exchange do not specify the payment of interest, interest is not allowable until maturity. But from the moment they fall due, they bear interest, whether it be so specified or not.

As a rule, compound interest is not allowable, but a contract is not usurious or void because of a stipulation for the payment of compound interest. The courts, however, will not enforce its payment, when the

agreement is made before any interest has accrued. If a debt already due has an accumulation of interest not paid, the parties may agree to have the principal and interest added together, and draw interest.

Interest is not allowable upon unliquidated demands for board and lodging, where price or time of payment is not agreed upon between the parties.

A lender, whether banker or broker, can charge a reasonable amount for his services in addition to the interest, without being liable for usury.

Interest in *advance* is allowed under certain limitations.

LANDLORD AND TENANT

Where a tenant hires rooms from another the relation of landlord and tenant is formed with certain corresponding rights and privileges. If the hiring be by the month, the tenant may leave when the month expires, without incurring any new liability. In such a case the landlord has the liberty of terminating the tenancy at the end of the month, and the power to dispossess the tenant, upon giving the latter five days' written notice that unless the tenant removes at the end of the month the landlord will resort to proceedings to dispossess him.

If the hiring be by the year, the same corresponding rights and privileges attach, excepting that the five days' preliminary notice need not be given to the yearly tenant. If the hiring is by the year, the tenant can not be dispossessed until the year expires, if the rent be paid in the meantime.

The difficulties tenants often experience arise from a misunderstanding of the nature of their hiring—that is, while they frequently regard it as by the year, the landlord regards it as by the month. If the court happens to agree with the landlord, in his construction with the hiring, the tenant must go; and in this respect the landlord has the advantage; tenements are generally hired by the month, at a monthly rental, and the printed receipt given provides that "the letting is by the month only." These circumstances tend to corroborate the landlord in his theory, which accounts for the fact that landlords generally succeed in their construction of those agreements.

If the tenant, instead of accepting these receipts providing that the hiring is "by the month only," will get the landlord to leave that provision out, his chances of remaining for the year are improved; and if he can induce the landlord to insert in the receipt the words, "the hiring is for one year," his possession for that time is assured. Where a tenant hires by the month and remains in possession after the expiration of the month, the landlord has an option either to treat the tenant as a trespasser or as a tenant for a renewed term of one month. He may treat him as a trespasser by dispossessing him, or as a tenant for a new term of one month by accepting the second month's rent.

In this way these monthly tenancies are sometimes continued for months, when all of a sudden they are brought to a close by five day's notice from the landlord that the tenant must remove at the end of the month.

If the hiring is by the month, it matters not what the landlord's reason for terminating it may be, the law gives him a legal right to bring it to a close, and his motive for so doing becomes immaterial.

The only way for a tenant to protect himself from this risk is by written agreement, specifying distinctly that he hires by the year, or by a receipt signed by the landlord or his agent, indicating in substance the same thing, or by an oral understanding, had in presence of witnesses, that the hiring is by the year, and for the tenant to refuse to accept receipts indicating that the hiring is by the month only.

Leases for one year or less need no written agreement. Leases for more than a year must be in writing; if for life, signed, sealed and witnessed in the same manner as any other document.

Leases for over three years must be recorded with the county clerk or public registrar. No particular form is necessary.

In the city of New York, when the duration of the occupation is not specified, the agreement shall be held valid until the first day of the May following the occupation under such agreement.

A landlord can no longer distress for rent in New York, nor has any lien on the goods and chattels of the tenant for rent due. Rent may be collected by action after the removal of the tenant.

A tenant is not responsible for taxes, unless it is so stated in the lease.

A lease falling into the hands of a party accidentally would be invalid, and must, in all cases, be delivered to the party for whom it is intended.

The tenant may underlet as much of the property as he may desire, unless it is expressly forbidden in the lease. Tenants at will can not underlet.

A lease made by a minor is not binding after the minor has attained his majority. But it binds the lessee, unless the minor should release him. Should the minor receive rent after attaining his majority, the lease will be thereby ratified. A lease given by a guardian will not extend beyond the majority of the ward. A new lease renders void a former lease.

In case there are no writings the tenancy begins from the day possession is taken; where there are writings and the time of commencement is not stated, the tenancy will be held to commence from the date of said writings.

If a landlord consents to receive a substitute, the former tenant is thereby released.

LIEN LAWS

Any one who, as contractor, sub-contractor, or laborer, performs any work, or furnishes any materials, in pursuance of, or in conformity with, any agreement or contract with the owner, lessee, agent, or one in possession of the property, toward the erection, altering, improving, or repairing of any building, shall have a lien for the value of such labor or materials on the building or land on which it stands, to the extent of the right, title and interest of the owner, lessee or person in possession at the time of the claimant's filing his notice with the clerk of the County Court.

This notice should be filed within ninety days after completion of the work, or the furnishing of the materials, and should state: (1) Name and residence of lienor; (2) Name of owner and his interest in property; (3) Name of person employing lienor, though failure to state the true name does not invalidate the lien; (4) Labor performed or material furnished; (5) Amount unpaid; (6) Time when first and last items of labor performed or materials furnished; (7) Description of property. Liens expire in one year unless action is begun or renewed by court order.

The following classes of persons are generally entitled to lien:

1. Bailees, who may perform labor and services on the thing bailed, at the request of the bailor.

2. Innkeepers, upon the baggage of guests they have accommodated.

3. Common carriers, upon goods carried, for the amount of their freight and disbursements.

4. Venders, on the goods sold for payment of the price where no credit has been expressly promised or implied.

5. Agents upon goods of their principals, for advancements for the benefit of the latter.

6. All persons are entitled to the right of lien who are compelled by law to receive property, and bestow labor and expense on the same.

The right of lien may be waived:

1. By express contract.
2. By neglect.
3. By new agreement
4. By allowing change of possession.
5. By surrendering possession.

The manner of the enforcement of a lien, whether it be an innkeeper's, agent's, carrier's, factor's, etc., depends wholly upon the nature and character of the lien.

LIMITATION OF ACTION—WHEN A DEBT IS OUTLAWED

Actions upon judgments or decrees of a court, or a contract under seal, or for the recovery of real estate, must be commenced within a period of twenty years from the date when the cause of action accrued.

All actions upon unsealed contracts, express or implied, become outlawed in six years.

Claims for damages to property become outlawed in six years.

Claims for damages for injury to the person or rights of another are outlawed in six years, except in cases of personal injuries caused by negligence, when the claim is outlawed in three years.

All actions for libel, slander, assault, battery, false imprisonment, for forfeitures or penalties to the people of the State, and for seduction and criminal conversation, are outlawed in two years.

Claims for the specific recovery of personal property and on judgments of courts not of record, are outlawed in six years.

In the case enforcing the payment of a bill, note, or other evidence of debt that may be issued by a moneyed corporation, or to enforce the payment of same issued or put in circulation as money, there is no limitation of time to sue.

An acknowledgment or new promise can not take a contract or other liability out of the statute of outlawry, unless it be in writing.

A payment on account of principal or interest takes the case out of the statute, without being in writing.

MARRIAGE

Marriage may be entered into by any two persons, with the following exceptions: Idiots, lunatics, persons of unsound mind, persons related by blood or affinity, within certain degrees prohibited by law; infants under the age of consent, which in the State of New York, is eighteen for both sexes, and all persons already married and not legally divorced.

The law relating to marriage, touching the prohibited degrees of kindred, age, and so forth, varies according to the statutes of the different States.

Marriage may be solemnized before a justice of the peace or a minister, a judge of a court of record, a mayor, alderman, police justice or magistrate.

But a precise compliance with all the requirements of law has not been deemed necessary; and in some important provisions it has been held that a disregard of them was punishable, but did not vitiate the marriage; as the want of consent of parents or guardians, where one party is a minor. The essential thing seems to be the declaration of consent by both parties, before a person authorized to receive such declaration by law.

Consent is the essence of this contract, as of all other contracts. Hence it can not be valid, if made by those who had not sufficient minds to consent, such as idiots or insane persons. Hence such marriages are void at common law and by the statutes of several of the States. It is usual, however, for such marriages to be declared void by a competent tribunal after a due ascertainment of the facts. In some of the States this can be done by common law courts.

From the necessity of consent, likewise, a marriage obtained by force or fraud is void; but the force or fraud must be certain and extreme.

The same is true if another husband or wife of either of the parties be living.

Bigamy or polygamy is an indictable offence in *all* the States, but exceptions are made in cases of long-continued absence, with belief of the death of the party, etc. But these exceptions to the criminality of the act do not change the question as to the validity of the second marriage, which is the same as before. And so if the parties are within the prohibited degrees of kindred.

The consent of parents or guardians to the marriage of minors depends on the statutes of the several States. Generally, if not universally, the marriage would be held valid, though the person celebrating it might be held punishable.

In the statutes of some of the States there are provisions to the effect that a marriage not lawfully celebrated by reason of the fraud of one of the parties shall yet be held valid in favor of the innocent party, as in case the husband imposed upon the wife by a forged or unauthorized license or a pretended clergyman.

MARRIAGE: CONTRACTS FOR

Contracts to marry at a future time are valid and as effectual in law as any; and, in actions upon them, damages may be recovered for pecuniary loss or for suffering and injury to condition and prospects.

Where the promise is mutual, an action for breach of promise may be maintained against a woman.

This action can not be maintained against an infant. But the infant may bring an action, in this case, against an adult.

A promise to give to a woman, or settle upon her, a specific sum or estate on her marriage, is valid.

MARRIAGE AND DIVORCE

The law and practice in relation to divorce differ in the different States, being exactly alike in no two of them.

Absolute divorce can be obtained in the State of New York for adultery alone.

Limited divorce is granted on the following grounds:

1. Idiocy or lunacy.
2. Consent of either party having been obtained by force or fraud.
3. Want of age or physical capacity.
4. The former husband or wife of the respective parties being still living.
5. Inhuman treatment, abandonment, neglect or failure on the part of the husband to provide for the wife.
6. Such conduct on the part of the defendant as would render it dangerous for plaintiff to cohabit with defendant.

A divorce *a vinculo* annuls the marriage entirely, and restores the parties to all the rights of unmarried persons, and relieves them from all liabilities that grew out of the marriage, except so far as may be provided by the statutes or made a portion of the decree by the court. Thus the statutes of some States provide that the guilty party shall not marry again. The court generally has the power to decree the terms of the separation, regarding alimony, possession of

children, and so forth. Strict care is taken to prevent divorce being obtained by collusion. It will not be granted merely upon the consent or default of the party charged, but only on the proof of cause alleged.

The causes of divorce from bed and board are now very commonly made sufficient for divorce from the bond of marriage. As a general rule, a woman divorced from the bed and board of her husband acquires the rights of an unmarried woman, with regard to property, business, and contracts. The husband is relieved from his general duty of maintaining her, the courts generally exercising their power of decreeing such maintenance by the husband as the character and circumstances of the case render fit.

In some of the States it is the custom of the legislatures to grant divorces by private acts, and this is sometimes done for the feeblest of reasons.

As a general rule, a divorce granted in a State in which both parties had their actual domicile, *and also* were married, is valid everywhere. Again, every State generally recognizes the validity of a divorce granted where both parties have their actual domicile, if granted in accordance with the law of that place.

In the United States the law on this subject is generally regulated by statutes, and these differ very much. In the absence of statutory provision, the rule of the courts generally is that a divorce which was valid where granted, and which was obtained in good faith, is valid everywhere.

MARRIAGES: FOREIGN

It is a doctrine of English and American law that a marriage which is valid where contracted is valid everywhere. But it is subject to some qualification. A marriage contracted elsewhere would not be held valid in a State the law of which forbade it as incestuous, although an issue might be made whether it would be held incestuous so far as to annul the marriage, if within the degrees prohibited by the laws of the State in which the question arose, or only if it be between kindred who are too near to marry by the law of the civilized world.

If a married man, a citizen of one of our States, went into a Mormon territory, and there married again, he would not be held on his return to be the lawful husband of two wives; or if a Mormon came to any of the States with two or more wives, he would not be held to be the lawful husband of all of them.

Though the rule is true that a marriage which is void when contracted is valid nowhere, there are exceptions to it: as if two Americans intermarried in China, where the marriage was performed in presence of an American chaplain, according to American forms. If such marriage were held void in China, it would be held valid in the United States.

The incidents of marriage, and contracts in relation to marriage, such as settlement of property, are construed by the law of the place where these were made, this being supposed to be the intention and agreement of the parties. But this rule does not hold when the parties are married while accidentally or temporarily absent from their homes, as then there is no domicile, and the marriage is regarded as constructively domestic.

MARRIED WOMEN: RIGHTS OF

Any and all property owned by a woman at the time of her marriage, together with the rents, issues, and profits thereof, and the property that comes to her by descent, devise, bequest, gift or grant, or which she acquires by her trade, business, labor, or services performed on her separate account, shall, notwithstanding her marriage, remain her sole and separate property, and may be used, collected, and invested by her in her own name, and shall not be subject to the interference or control of her husband, or be liable for his debts, unless for such debts as may have been contracted for the support of herself or children by her as his agent.

A married woman may also bargain, sell, assign, transfer, and convey such property and enter into contracts concerning the same on her separate trade, labor or business with the same effect as if she were not married. But her husband is not liable for such contracts, and they do not render him or his property in any wise liable therefor. She may also sue and be sued in all matters having relation to her sole and separate property in the same manner as if she were sole.

A married woman's contract may be enforced against her and her separate estate:

First—When the contract is created in or respecting the carrying on of the wife's trade or business.

Second—When it relates to or is made for the benefit of her sole or separate estate.

Third—When the intention to charge the separate estate is expressed in the contract creating the liability.

When a husband receives a principal sum

of money belonging to his wife, the law presumes that he receives it for her use, and that he must account for it, or expend it on her account by her authority or direction, or that she gave it to him as a gift.

Should he receive interest or income and spend it without her knowledge and without objection, a gift will be presumed from acquiescence.

Money received by a husband from his wife and expended by him, under his direction, on his land, in improving the home of the family, is a gift, and can not be recovered by the wife, or reclaimed, or an account demanded

An appropriation of her separate property by a wife, herself, to the use and benefit of her husband, in the absence of an agreement to repay, or any circumstances from which such an agreement can be inferred, will not create the relation of debtor and creditor, nor render the husband liable to account.

And though no words of gift be spoken, a gift by a wife to her husband may be shown by the nature of the transaction itself, or it may appear from the attending circumstances.

A wife who deserts her husband without cause is not entitled to the aid of a Court of Equity in getting possession of such chattels as she has contributed to the furnishing and adornment of her husband's house. Her legal title remains, and she could convey her interest to a third party by sale, and said party would have a valid title, unless her husband should prove a gift.

A wife's property is not liable to a lien of a sub-contractor for materials furnished to the husband for the erection of a building thereon, where it is not shown that the wife consented to the improvements, was notified of the intention to furnish the materials, or a settlement made with the contractor and given to the wife, to her agent or trustee.

NOTES AND BILLS OF EXCHANGE

Notes are entitled to three days' grace in most States, that is, the note is not payable till the third day after the day expressed for its payment. Notes made payable "on demand" are not entitled to grace, and grace has been abolished in New York, although notes due Saturday are payable Monday.

In the following cases there are no days of grace:

1. Bills of exchange or drafts, payable at sight at any place within this State, shall be deemed due and shall be payable on presentation, without the allowance of any days' grace.

2. Checks, bills of exchange or drafts appearing on their face to have been drawn upon any bank, or banking association, or banker, carrying on banking business under the act to authorize the business of banking, which are on their face payable on any specified day, or in any number of days after the date or sight thereof, shall be deemed due and payable on the day mentioned for payment of same, nor shall it be necessary to protest the same for non-acceptance.

When the note or bill falls due on Sunday or Saturday, or any public holiday when general business is suspended, the presentment for payment must be made on the Monday following the Sunday or Saturday, or the day succeeding the holiday.

As a general rule, the note or bill must be presented for payment on the last day it falls due, and the drawers and indorsers must be notified of non-payment not later than the following day.

Notes and bills, when made payable to or at any person's order and indorsed in blank, pass by delivery.

The words "value received," though ordinarily used, are not indispensable, as value is held to be implied.

Notes do not bear interest except when it is so stated. After maturity all notes bear legal interest.

The holder of a note that is made payable to order may sue in his own name.

A promissory note given by a minor is void.

The indorser of an accommodation is a surety for the maker, and he is liable to the costs of collection that may be brought against such maker or indorser.

Any promise to pay, without specifying the time of payment, is equivalent to a promise to pay on demand.

PARTNERSHIP

The general rule is that every person of sound mind, and not otherwise restrained by law, may enter into a contract of partnership.

There are several kinds of partners, which may be classed as follows:

1. *Ostensible* partners, or those whose names are made public as partners, and who in reality are such, and who take all the benefits and risks.

2. *Nominal* partners, or those who appear before the public as partners, but who have no real interest in the business.

3. *Dormant,* or *silent,* partners, or those whose names are not known or do not appear as partners, but who, nevertheless, have an interest in the business.

4. *Special* partners, or those who are interested in the business only to the amount of the capital they have invested in it.

5. *General* partners, who manage the business, while the capital, either in whole or in part, is supplied by a special partner or partners. They are liable for all the debts and contracts of the firm.

A nominal partner renders himself liable for all the debts and contracts of the firm.

A dormant partner, if it becomes known that he has an interest, whether creditors trusted the firm on his account or not, becomes liable equally with the other partners.

The partnership firm is responsible for any acts done by any partner, touching the partnership business.

The representation or misrepresentation of any fact made by any partner within the sc pe of the business, is binding on the firm.

A notice to or by any of the firm is deemed a notice to or by all of them.

Each partner is liable to third parties for the whole partnership debts.

The articles of partnership must in all cases be in writing.

All partnerships in New York State must file in the County Clerk's office a certificate showing who comprise the partnership.

A violation of these provisions constitutes a misdemeanor, and is punishable by a fine not exceeding $1,000.

The following are the exceptions to this rule:

1. Firms having business relations with foreign countries.

2. Firms that have transacted business in this State for five years or more.

In the above cases, a certificate of the change in the persons constituting the partnership, and declaring the persons thus dealing under the partnership name, shall be made and filed with the County Clerk, and published for four consecutive weeks in a newspaper of the town which shall be the principal place of business of such firm.

Should a firm fail to comply with these provisions, the law would refuse to lend its aid to such a firm in enforcing its contracts.

PROPERTY EXEMPT FROM ATTACHMENT ON EXECUTION

The different States have different laws relative to the property exempted by statute from attachment and execution.

In the State of New York the following *personal* property is exempt:

First—All spinning-wheels, weaving-looms, and stoves put up or kept for family use in any dwelling-house, and one sewing-machine with appurtenances.

Second—The family Bible, family pictures, and school-books used by or in the family, and books—not exceeding fifty dollars in value—part of the family library.

Third—A pew or seat in church, used by the debtor or his family.

Fourth—Ten sheep, with their fleeces, and the yarn or cloth manufactured therefrom, together with one cow and two swine, and the necessary food for them.

Fifth—All pork, beef, fish, flour, and vegetables provided for family use; and fuel, oil and candles necessary for family for sixty days.

Sixth—All necessary wearing apparel, beds, bedsteads, and bedding for debtor and family; all arms and accoutrements required by law; all necessary cooking utensils; one table, six chairs, six knives and forks, six plates, six tea-cups and saucers. one sugar-dish, one milk-pot, one tea-pot, six spoons, one crane with appendages, one pair of andirons, one shovel and tongs, and all the tools and implements of a mechanic necessary to carry on his trade, to the value of twenty-five dollars.

In addition to the above, when owned by a householder or anybody having a family for which he provides, the following exemptions are made. All necessary household furniture, working tools, professional instruments, furniture, and library; a team not worth over $250, and the food necessary for such team for ninety days, except on executions for purchase-money for such, or for wages of a domestic in the family, in which case the debtor is not entitled to the benefit of the exemptions; lastly, land not over a quarter of an acre set apart for burial-place, and the vault thereon.

The following *real* property is exempted:

The lot and building thereon to the value of one thousand dollars, owned and occupied as a residence by the debtor. This exemption continues after the death of the judgment-debtor for the benefit of his widow and family, until the youngest child becomes of age, and until the death of the widow, on condition that one or more of the family occupy the premises.

To be valid, the release of the exemption must be in writing, subscribed by the householder, and acknowledged in the same way as a conveyance of real estate. No prop-

erty is exempted from sale for the non-payment of taxes, assessments, or a debt contracted for the purchase-money of the property, or contracted previous to the recording of the deed as required by law.

If the sheriff holding the execution thinks the property worth more than one thousand dollars, he must summon six qualified jurors of his county, and have the premises appraised and sold accordingly within sixty days, unless the debtor pays meantime the surplus over and above one thousand dollars. In case the premises are sold, the debtor receives one thousand dollars, the surplus going to the liquidation of the debt.

PROPERTY EXEMPT FROM FORCED SALES

	Personal property, value	Acres of land	Homestead value
Alabama,	$1000	160	$2000
Arkansas,	500	160	2500
California,	900	...	5000
Colorado,	1000	...	2000
Connecticut,	500	...	....
Delaware,	200	...	....
Florida,	1000	160	....
Georgia,	300	50	1600
Idaho,	300	...	5000
Illinois,	300	...	1000
Indiana,	600	...	....
Iowa,	200	40	....
Kansas,	800	160	....
Kentucky,	200	...	1000
Louisiana,	2000 to cover value of all exemptions.		
Maine,	300	...	500
Maryland,	100	...	....
Massachusetts,	450	...	800
Michigan,	400	40	1500
Minnesota,	800	80	....
Mississippi,	550	80	2000
Missouri,	300	160	1500
Montana,	900	...	5000
Nebraska,	....	160	2000
Nevada,	900	...	5000
New Hampshire,	450	...	500
New Jersey,	200	...	1000
New York,	250	...	1000
North Carolina,	500	...	1000
North Dakota,	1500	160	....
Ohio,	100	...	1000
Oregon,	175	...	....
Pennsylvania,	300	...	....
Rhode Island,	500	...	....
South Carolina,	500	...	1000
South Dakota,	1500	160	....
Tennessee,	1200	...	1000
Texas,	....	200	5000
Utah,	....	...	1000
Vermont,	200	...	500
Virginia,	200	...	1000
Washington,	900	...	5000
West Virginia,	200	...	1000
Wisconsin,	450	40	....
Wyoming,	900	...	5000

WILLS

All persons of sound mind and proper age may dispose of their property by last will and testament. In some States minors may bequeath personal property. The limitation for disposing of personal estate by will is eighteen years for males and sixteen years for females.

All wills must be made in writing and subscribed with the testator's full name, unless the person be prevented from so doing by the extremity of his last illness, when his name may be signed in his presence, and by his express direction.

A will requires at least two attesting witnesses.

The form of a will is not material, provided it manifests, in a sufficiently clear manner, the intention of the testator. It may be put in any language he may choose.

A will may be revoked at any time by the testator.

The following are among the modes of revoking a will:

First. By subsequent instrument. A second will nullifies a former one, provided it contains words expressly revoking it, or that it makes a different and incompatible disposition of the property.

Second. By the destruction of the will.

Third. By marriage. Marriage, and the birth of a child after the execution of a will, is a presumptive revocation of such will, provided a wife and a child are left unprovided for.

The will of an unmarried woman is annulled by her marriage. She may make a deed of settlement of her estate, however, before marriage, empowering her to retain the right to make a will after marriage.

Children born after the execution of the will, and in the lifetime of the father, will inherit at the death of the testator in like manner as if he had died without making a will.

Fourth. By alteration of estate. Any alteration of the estate or interest of the testator in the property devised, implies a revocation of the will.

A sale of the devised property, or a valid agreement to sell it, is a legal revocation of such will.

A codicil, so far as it may be inconsistent with the will, works as a revocation.

A subsequent will, duly executed, revokes all former wills, though no words to that effect may be used.

Property can not be devised to corporations, unless they are expressly authorized to receive bequests by their charters.

A will should not be written by a legatee or devisee, nor should either of them, or an executor, or any one interested in the will be called upon to witness such will.

Aliens not authorized by law to hold property can not receive bequests.

All debts and incumbrances must be settled before the bequests shall be distributed.

A codicil, that is an addition or supplement to a will, must be executed with the same formalities as the will itself. The witnesses may be the same or different ones. When there are several codicils, the later operate to revive and republish the earlier ones.

LAWS GOVERNING APPLICATIONS FOR PATENTS

APPLICATIONS for letters patent must be made to the Commissioner of Patents, and signed by inventors. A complete application comprises the first fee of $15, a petition, specification, oath (in English language) and drawings, model or specimen when required. A drawing is required whenever the case admits of it. A model is required or admitted as a part of the application only when, on examination, the primary examiner finds it necessary or useful.

Specification and claim must be signed by inventor and attested by two witnesses.

The oath made is that inventor believes himself to be original and first discoverer of the art, machine, manufacture, composition, or improvement; that he does not believe or know that it was ever before known or used, and the country of which he is a citizen or subject. This oath may be made before any duly authorized person in the United States, or if the applicant is in a foreign country, before any minister, charge d'affaires, consul or commercial agent, holding a commission under the United States Government.

Drawings must be artistically executed. The Patent Office will make necessary corrections at the applicant's option and cost. The office will furnish the drawings at cost for applicants who desire that assistance.

A working model is often desirable. Applications filed are classified according to the various arts, and are examined in order of filing. Upon rejection of application examiner must cite the best references at his command. If domestic patents be cited, their dates and numbers, the names of the patentees, and the classes of invention are stated. The applicant may amend before or after first rejection or action, and he may amend as often as the examiner presents new reasons for rejection, showing how amendments avoid references and objections.

Patents for designs are granted for 3½, 7, or 14 years.

A reissue is granted to original patentee when original patent is inoperative on account of defective specification.

Provisions are made for hearings before the commissioner, and interviews with examiners.

Any citizen who has made a new invention or discovery and desires further time to mature same may, on payment of $10, file in patent office a caveat setting forth objects and characteristics of the invention. Such caveat is operative for one year.

Following is a schedule of fees, payable in advance: Filing original application, $15; issuing of patent, $20; designs (3½ years), $10; designs (7 years), $15; designs (14 years), $30; caveats, $10; reissue, $30; filing disclaimer, $10. Certified copies of patents, 10 cents per 100 words. Certified copies, printed patents, 80 cents. Uncertified printed copies of specifications and drawings or any number of unclassified copies, 5 cents each. For copies by sub-classes, 3 cents each. Copies by classes, 2 cents each. Recording every assignment, agreement, power of attorney, or other paper, of 300 words or under, $1. For every 300 and under 1,000, $2; for over 1,000, $3.

NATURALIZATION LAWS OF THE UNITED STATES

THE conditions under and the manner in which an alien may be admitted to become a citizen of the United States are prescribed by Sections 2165-74 of the Revised Statutes of the United States.

DECLARATION OF INTENTION

The alien must declare upon oath before a circuit or district court of the United States, or a district or supreme court of the Territories, or a court of record of any of the States having common law jurisdiction, and a seal and clerk, two years at least prior to his admission, that it is, *bona fide*, his intention to become a citizen of the United States, and to renounce forever all allegiance and fidelity to any foreign prince or State, and particularly to the

one in which he may be at the time a citizen or subject.

OATH ON APPLICATION FOR ADMISSION

He must, at the time of his application to be admitted, declare on oath, before some one of the courts above specified, that he will support the Constitution of the United States, and that he absolutely and entirely renounces and abjures all allegiance and fidelity to every foreign prince, potentate, State or sovereignty, and particularly, by name, to the prince, potentate, State or sovereignty of which he was before a citizen or subject, which proceedings must be recorded by the clerk of the court.

CONDITIONS FOR CITIZENSHIP

If it shall appear to the satisfaction of the court to which the alien has applied that he has resided continuously within the United States for at least five years, and within the State or Territory where such court is at the time held one year at least; and that during that time "he has behaved as a man of good moral character, attached to the principles of the Constitution of the United States, and well disposed to the good order and happiness of the same," he will be admitted to citizenship.

TITLES OF NOBILITY

If the applicant has borne any hereditary title or order of nobility, he must make an express renunciation of the same at the time of his application.

SOLDIERS

Any alien of the age of twenty-one years and upward, who has been in the armies of the United States and has been honorably discharged therefrom, may become a citizen on his petition, without any previous declaration of intention, provided that he has resided in the United States at least one year previous to his application, and is of good moral character. (It is judicially decided that residence of one year in a particular State is not requisite.)

MINORS

Any alien under the age of twenty-one years who has resided in the United States three years next preceding his arriving at that age, and who has continued to reside therein to the time he may make application to be admitted a citizen thereof, may, after he arrives at the age of twenty-one years, and after he has resided five years within the United States, including the three years of his minority, be admitted a citizen; but he must make a declaration on oath and prove to the satisfaction of the court that for two years next preceding it has been his *bona fide* intention to become a citizen.

CHILDREN OF NATURALIZED CITIZENS

The children of persons who have been duly naturalized, being under the age of twenty-one years at the time of the naturalization of their parents, shall, if dwelling in the United States, be considered as citizens thereof.

CITIZENS' CHILDREN WHO ARE BORN ABROAD

The children of persons who now are or have been citizens of the United States are, though born out of the limits and jurisdiction of the United States, considered as citizens thereof.

CHINESE

The naturalization of Chinamen is expressly prohibited by Section 14, Chapter 126, Laws of 1882.

PROTECTION ABROAD TO NATURALIZED CITIZENS

Section 2000 of the Revised Statutes of the United States declares that "all naturalized citizens of the United States while in foreign countries are entitled to and shall receive from this government the same protection of persons and property which is accorded to native-born citizens."

THE RIGHT OF SUFFRAGE

The right to vote comes from the State, and is a State gift. Naturalization is a federal right, and is a gift of the Union, not of any one State. In nearly one-half the Union aliens (who have declared intentions) vote and have the right to vote equally with naturalized or native-born citizens. In the other half only actual citizens may vote. The federal naturalization laws apply to the whole Union alike, and provide that no alien may be naturalized until after five years' residence. Even after five years' residence and due naturalization he is not entitled to vote unless the laws of the State confer the privilege upon him, and he may vote in one State (Minnesota) four months after landing, if he has immediately declared his intention, under United States law, to become a citizen.

FORMS OF COMMON LEGAL DOCUMENTS

IN legal documents of all descriptions the form is an all-important consideration. This is true for two very good reasons: (1) The wording of a document in accordance with certain general forms is required by legal conventions, if not by direct laws on the subject: (2) The unescapable necessity of being clear and explicit is best attained by the use of certain forms that have long been in use.

On the subject of clearness, we may say that legal documents follow rules that are the reverse of those recognized in rhetoric. Instead of being simply and directly worded, they are prolix, redundant, often complicated and difficult of comprehension by the lay mind. To the lawyer, however, these violations of pure and chaste style are essential to adequate and unmistakable descriptions and precise statements. The reason of this is that a brief sentence, while clear for all ordinary purposes, can be shown to admit of several interpretations. Hence, unless sufficiently detailed statements are used, there may be an opportunity for misunderstanding. This is particularly true in the case of wills and deeds to real property. Many a valid will has been broken simply because the person who drew it up did not provide against all possible contingencies. The same is true of realty deeds: flaws in titles have often been created by the carelessness or oversight of those who prepared the papers.

For the instruction and assistance of the reader a number of specimen legal forms are given in the following pages. Some of these may be adopted as they stand, without requiring the services of an attorney. In the cases, however, of wills, realty deeds, business agreements, mortgages—in short, matters involving sums of money or property rights—the conditions can not always be perfectly covered. Consequently, a wise man will consult a reliable lawyer before signing his name. Ten dollars paid in lawyer's fees has often saved as many thousands to people who would, otherwise, have blundered gravely.

GENERAL FORM OF AGREEMENT

THIS AGREEMENT, made the *first* day of *May*, one thousand nine hundred and one, between JOHN DOE, of the *city* of *Hartford*, in the county of *Hartford* and State of *Connecticut*, of the first part, and RICHARD ROE, of the *village* of *Windsor*, in *said county and State*, of the second part—

WITNESSETH, that the said JOHN DOE, in consideration of the covenants on the part of the party of the second part, hereinafter contained, doth covenant and agree to and with the said RICHARD ROE, that [*here insert the agreement on the part of John Doe*].

And the said RICHARD ROE, in consideration of the covenants on the part of the party of the first part, doth covenant and agree to and with the said JOHN DOE, that [*here insert the agreement on the part of Richard Roe*].

In witness whereof, we have hereunto set our hands and seals, the day and year first above written.

Sealed and delivered, in presence of THOS. BROWN. JOHN SMITH, } JOHN DOE. [L.S.] RICHARD ROE. [L.S.]

[*When required this clause may be inserted:*]

And it is further agreed, between the parties hereto, that the party that shall fail to perform this agreement on his part, will pay to the other the full sum of *fifty* dollars, as liquidated, fixed, and settled damages.

AGREEMENT FOR THE PURCHASE OF A HOUSE AND LOT

MEMORANDUM of an agreement made this 15th day of November, in the year 1900, between JOHN SMITH, Jeweler, of the city of New York, and HENRY BROWN, Merchant, of the same city, *witnesseth*—That the said JOHN SMITH agrees to sell, and the said HENRY BROWN agrees to purchase, for the price or consideration of —— dollars, the house and lot known and distinguished as number ninety-nine, in —— street, in the said city of New York. The possession of the property is to be delivered on the first day of May next, when twenty-five per cent of the purchase money is to be paid in cash, and a bond and mortgage on the premises, bearing six per cent interest, payable in five years (such interest payable quarterly), is to be executed for the balance of the purchase money, at which time also a deed of conveyance in fee simple, containing the usual full covenants and warranty, is to be delivered, executed by the said JOHN SMITH and wife, and the title made satisfactory to the said HENRY BROWN; it being understood that this agreement shall be binding upon the heirs, executors, administrators, and assigns of the respective parties; and also that the said premises are now insured for —— dollars, and, in case the said house should be burnt before the said first day of May next, that the said JOHN SMITH shall hold the said insurance in trust, and will then transfer the same to said HENRY BROWN with the said deed.

In witness, etc. [*as in General Form*].

AGREEMENT FOR THE SALE OF REAL ESTATE

THIS AGREEMENT, made the —— day of ——, in the year one thousand nine hundred and one, between A. B. of ——, of the first part, and C. D. of ——, of the second part, in manner following: The said party of the first part in consideration of the sum of ——, to be fully paid as hereinafter mentioned, hereby agrees to sell unto the said party of the second part (here describe property). And the said party of the second part hereby agrees to purchase said premises at the said consideration of —— dollars, and to pay the same as follows: (Here give table of payments.) And the said party of the first part, on receiving such payment at the time and in the manner above mentioned, shall, at his own proper costs and expenses, execute, acknowledge and deliver to said party of the second part, or to his assigns, a proper deed containing a general warranty and the usual full covenants for the conveying and assuring to him or them the fee simple of the said premises, free from all incumbrance, it be-

ing understood and agreed that the instruments referred to in within contract, to be executed and delivered, shall conform to the requirements of Chapter 475, Law of 1890, relating to Deeds, Bonds, and Mortgages, so far as the same is applicable thereto, and which deed shall be delivered on the —— day of —— at —— o'clock A.M., at ——. The risk of loss or damage by fire prior to the completion of this contract is hereby assumed by the party of the (first or second) part. The rents of the said premises (if any) shall be adjusted, apportioned and allowed up to the day of taking title. And it is understood that the stipulations aforesaid are to apply to and bind the heirs, executors, administrators, and assigns of the respective parties.

In witness, etc. [*as in General Form*].

State of ——, County of —— } ss:

On this —— day of —— in the year one thousand nine hundred —— before me personally came ——, to me known, and known to me to be the individuals described in and who executed the foregoing instrument, and they thereupon acknowledged to me that they had executed the same.

AGREEMENT FOR BUILDING A HOUSE

MEMORANDUM.—That on this —— day of ——, it is agreed between A. B. of —— and C. D. of ——, in manner following, viz.: the said C. D., for the considerations hereinafter mentioned, doth for himself, his heirs, executors, and administrators, covenant with the said A. B., his executors, administrators, and assigns, that he, the said C. D. or his assigns, shall and will, within the space of —— next after the date hereof, in a good and workmanlike manner, and at his own proper charge and expense, at ——, well and substantially erect, build, and finish, one house, or messuage, according to the draught, scheme, and explanation hereunto annexed, with such stone, brick, timber, and other materials, as the said A. B. or his assigns shall find and provide for the same. In consideration whereof, the said A. B. doth for himself, his executors, and administrators covenant with the said C. D., his executors, administrators, and assigns, well and truly to pay unto the said C. D., his executors, administrators, and assigns, the sum of $—— of lawful money of the United States, in manner following, viz.: [one-half, one-third, etc.], part thereof at the beginning of the said work; —— another part thereof when the said work shall be half done; and the remaining —— in full for the said work, when the same shall be completely finished: And also that he, the said A. B., his executors, administrators, or assigns, shall and will from time to time, as the same shall be required, at his and their own proper expense, find and provide stone, brick, timber, and other materials necessary for making, building, and finishing the said house. And for the performance of all and every the articles and agreements above mentioned, the said A. B. and C. D. do hereby bind themselves, their executors, administrators, and assigns, each to the other, in the penal sum of —— firmly by these presents.

In witness, etc. [*as in General Form*].

AGREEMENT TO BE SIGNED BY AN AUCTIONEER, AFTER A SALE OF LAND AT AUCTION

I HEREBY acknowledge that A. B. has been this day declared by me the highest bidder and purchaser of [*describe the land*], at the sum of —— dollars [*or*, at the sum of —— dollars —— cents per acre or foot], and that he has paid into my hands the sum of ——, as a deposit, and in part payment of the purchase money; and I hereby agree that the vendor, C. D., shall in all respects fulfil the conditions of sale hereunto annexed. Witness my hand, at ——, on the —— day of ——, A.D. 1901.

L. S., *Auctioneer.*

ARTICLES OF COPARTNERSHIP

ARTICLES of copartnership made and concluded this —— day of ——, in the year one thousand nine hundred and one, by and between A. B., bookseller, of the first part, and C. D., bookseller, of the second part, both of ——, in the county of ——.

Whereas, it is the intention of the said parties to form a copartnership, for the purpose of carrying on the retail business of booksellers and stationers, for which purpose they have agreed on the following terms and articles of agreement, to the faithful performance of which they mutually bind and engage themselves each to the other, his executors and administrators.

First. The style of the said copartnership shall be "—— and company"; and it shall continue for the term of —— years from the above date, except in case of the death of either of the said parties within the said term.

Second. The said A. B. and C. D. are the proprietors of the stock, a schedule of which is contained in their stock book, in the proportion of two-thirds to the said A. B., and of one-third to the said C. D.; and the said parties shall continue to be owners of their joint stock in the same proportions; and in case of any addition being made to the same by mutual consent, the said A. B. shall advance two-thirds, and the said C. D. one-third of the cost thereof.

Third. All profits which may accrue to the said partnership shall be divided, and all losses happening to the said firm, whether from bad debts, depreciation of goods, or any other cause or accident, and all expenses of the business, shall be borne by the said parties in the aforesaid proportions of their interest in the said stock.

Fourth. The said C. D. shall devote and give all his time and attention to the business of the said firm as a salesman, and generally to the care and superintendence of the store; and the said A. B. shall devote so much of his time as may be requisite, in advising, overseeing, and directing the importation of books and other articles necessary to the said business.

Fifth. All the purchases, sales, transactions, and accounts of the said firm shall be kept in regular books, which shall be always open to the inspection of both parties and their legal representatives respectively. An account of stock shall be taken, and an account between the said parties shall be settled, as often as once in every year, and as much oftener as either partner may desire and in writing request.

Sixth. Neither of the said parties shall subscribe any bond, sign or indorse any note of hand, accept, sign, or indorse any draft or bill of exchange, or assume any other liability, verbal or written, either in his own name or in the name of the firm, for the accommodation of any other person or persons whatsoever, without the consent in writing of the other party; nor shall either party lend any of the funds of the copartnership without such consent of the other partner.

Seventh. No importation, or large purchase of books or other things, shall be made, nor any transaction out of the usual course of the retail business shall be undertaken by either of the partners, without previous consultation with, and the approbation of, the other partner.

Eighth. Neither party shall withdraw from the joint stock, at any time, more than his share of the profits of the business then earned, nor shall either party be entitled to interest on his share of the capital; but if, at the expiration of the year, a balance of profits be found due to either partner, he shall be at liberty to withdraw the said balance, or to leave it in the business, provided the other partner consent thereto, and in that case he shall be allowed interest on the said balance.

Ninth. At the expiration of the aforesaid term, or earlier dissolution of this copartnership, if the said parties or their legal representatives can not agree in the division of the stock then on hand, the whole copartnership effects, except the debts due to the firm, shall be sold at public auction, at which both parties shall be at liberty to bid and purchase like other individuals, and the proceeds shall

be divided, after payment of the debts of the firm, in the proportions aforesaid.

Tenth. For the purpose of securing the performance of the foregoing agreements, it is agreed that either party, in case of any violation of them or either of them by the other, shall have the right to dissolve this copartnership forthwith, on his becoming informed of such violation.

In witness, etc. [*as in General Form.*]

AGREEMENT TO CONTINUE THE PARTNERSHIP; TO BE INDORSED ON THE BACK OF THE ORIGINAL ARTICLES

Whereas, the partnership evidenced by the within-written articles has this day expired by the limitations contained therein [*or*, will expire on the —— day of —— next], it is hereby agreed, that the same shall be continued on the same terms, and with all the provisions and restrictions therein contained, for the further term of —— years from this date [*or* from the —— day of —— next.]

In witness, etc. [*as in General Form.*]

DEED WITHOUT COVENANTS

This indenture, made the —— day of ——, in the year of our Lord one thousand ——, between A. B., of, etc., of the first part, and C. D., of, etc., of the second part, Witnesseth: That the said party of the first part, for and in consideration of the sum of fifty dollars, to him in hand paid, by the said party of the second part, the receipt whereof is hereby acknowledged, hath bargained and sold, and by these presents doth bargain and sell, unto the said party of the second part, and to his heirs and assigns forever, all. etc. [*Here describe the property.*] Together with all and singular, the hereditaments and appurtenances thereunto belonging, or in any wise appertaining, and the reversion and reversions, remainder and remainders, rents, issues, and profits thereof; and also all the estate, right, title, interest. claim, or demand, whatsoever of him the said party of the first part, either in law or equity, of, in, and to, the above bargained premises, and every part and parcel thereof: To have and to hold to the said party of the second part, his heirs and assigns, to the sole and only proper use, benefit, and behoof, of the said party of the second part, his heirs and assigns, forever.

In witness whereof, we have hereunto set our hands and seals, the day and year first above written.

Sealed and delivered in presence of
John Smith,
Frank Robinson.

A. B. [L. S.]
C. D. [L. S.]

CONVEYANCES OF LANDS ON SALE BY MORTGAGE

This indenture, made the —— day of ——, in the year —— between A. B., of, etc., of the one part, and C. D., of, etc., of the other part. Whereas, E. F., of, etc., did, by a certain indenture of mortgage dated the —— day of ——, in the year ——, for the consideration of ——, bargain and sell unto the said A. B., and to his heirs and assigns forever, all that certain, etc.; together with all and singular the hereditaments and appurtenances thereunto belonging: To have and to hold the said granted and bargained premises, with the appurtenances, unto the said A. B., his heirs and assigns, to the only proper use and behoof of the said A. B., his heirs and assigns forever; provided, nevertheless, and the said indenture of mortgage was thereby declared to be upon condition, that if the said E. F., his heirs, executors, or administrators, should well and truly pay unto the said A. B., his executors, administrators, or assigns, the just and full sum of ——, with lawful interest for the same, on or before the —— day of——, in the year ——, according to the condition of a certain bond or writing, obligatory, bearing even date with the said indenture of mortgage, that then, and in such case, the said indenture, and the said writing obligatory, should be void and of no effect: and the said E. F. did, by the said indenture, for himself, his heirs, and assigns, agree with the said A. B., his heirs, executors, administrators, and assigns, that in case it should so happen, that the said sum of ——, and the interest for the same, should be due and unpaid at the time limited for the payment thereof, in the whole or in part thereof, that then it should and might be lawful for the said A. B., his heirs or assigns, at any time after default in payment, to bargain, sell, and dispose of the said mortgaged premises, with the appurtenances, at public vendue, and out of the moneys to arise from the sale thereof, to retain and keep the said sum of —— dollars, and the interest, or so much thereof as might be due, together with the costs and charges of such sale, or sales, rendering the overplus money, if any, to the said E. F., his heirs, executors, administrators, or assigns: And, whereas the said E. F. did not pay to the said A. B. the said sum of money, with the interest, at the time limited for payment, or at any time since: and the said A. B. hath, therefore, in pursuance of the authority so given to him as aforesaid, and according to the statute in such case made and provided, caused the premises to be advertised and sold at public auction; and the same has been struck off to the said C. D., for ——, being the highest sum bid for the same.

Now, therefore, this indenture witnesseth that the said A. B., in pursuance of the power and statute aforesaid, and also for and in consideration of the said sum of ——, to him in hand paid, by the said C. D., at and before the ensealing and delivery hereof, the receipt whereof is hereby acknowledged, hath granted, bargained, aliened, released, and confirmed, and by these presents doth grant, bargain, sell, alien, release, and confirm unto the said C. D., and to his heirs and assigns forever, all the farm, piece, or parcel of land above mentioned, together with the hereditaments and appurtenances, as the same is described and conveyed by said indenture of mortgage; and all the estate, right, title, interest, claim, and demand at law and in equity, of him the said A. B., and also of the said E. F., as far forth as the said A. B. hath power to grant and convey the same, of, in, and to the premises, and every part and parcel thereof: To have and to hold the said above granted and bargained premises, with the appurtenances, unto the said C. D., his heirs and assigns, to the sole and only proper use and behoof of the said C. D., his heirs and assigns, forever.

In witness, etc. [*as in General Form of Agreement.*]

DEED OF GIFT OF PERSONAL ESTATE

Know all men by these presents, that I, A. B., of, etc., in consideration of the natural love and affection which I have and bear for my son, C. B., and also for divers other good causes and considerations, I, the said A. B., hereunto moving, have given, granted, and confirmed, and by these presents, do give, grant, and confirm unto the said C. B., all and singular, my goods, chattels, leases, and personal estate whatsoever, in whose hands, custody, or possession soever they be: To have, hold, and enjoy, all and singular, the said goods, chattels, and personal estate, aforesaid, unto the said C. B., his executors, administrators, and assigns, to the only proper use and behoof of the said C. B., his executors, administrators, and assigns, forever. And I, the said A. B., all and singular, the said goods, chattels, personal estate, and other the premises, to the said C. B., his executors, administrators, and assigns, against me, the said A. B., my executors and administrators, and all and every other person and persons, whatscever, shall and will warrant, and forever defend, by these presents; of all and singular which said goods, chattels, personal estate, and other premises, I, the said A. B., have put the said C. B. in full possession, by delivering to him one pewter dish, at the time of the sealing and delivery of these presents, in the name of the whole premises hereby granted.

In witness, etc. [*as in General Form of Agreement.*]

DEED OF GIFT BY A FATHER TO A SON OF HIS PERSONAL PROPERTY, ON CONDITIONS

THIS indenture, made the, etc., between A. B., of, etc., of the one part, and C. B., of, etc., of the other part. Whereas, the said A. B., being the father of the said C. B., by reason of his age and infirmities, is not capable of attending to his estate and affairs as formerly, and has therefore agreed, for advancement of the said C. B., to make over his property to the said C. B., so that the said C. B. should pay the debts of the said A. B., and afford him a maintenance as is hereinafter mentioned: Now this indenture *Witnesseth:* That the said A. B., in order to carry the said agreement into effect, and in consideration of the natural love and affection which he hath for and toward his son, the said C. B., and of the provisos, covenants, and agreements, hereinafter mentioned, by the said C. B., to be observed and performed, hath given, granted, bargained, sold, and assigned, and by these presents doth give, grant, bargain, sell, and assign, unto the said C. B., his executors, administrators, and assigns, all and singular, his household goods and implements of household, stock in trade, debts, rights, credits, and personal estate, whereof he is now possessed, or any way interested in or entitled unto, of what nature or kind soever the same are, or wheresoever or in whosesoever hands they be or may be found, with their and every of their rights, members, and appurtenances: To have and to hold the said goods, household stuff, stock in trade, debts, rights, and personal estate, and the other the premises, unto the said C. B., his executors, administrators, and assigns, forever, without rendering any account or being therefore in any wise accountable to the said A. B., his heirs, executors, or administrators, for the same.

And the said C. B., for himself, his heirs, executors, and administrators, doth covenant, promise, grant, and agree, to and with the said A. B., his executors, administrators, and assigns, in manner and form following, that is to say; that he, the said C. B., his heirs, executors, and administrators, shall and will, settle, pay, discharge, and satisfy, or cause to be settled, paid, discharged, and satisfied, all accounts, debts, judgments, and demands of every nature and kind whatsoever, now outstanding against, or now due from or payable by the said A. B., or for the payment of which the said A. B. shall be liable, or be held liable either at law or equity on account of any matter, cause, or thing heretofore had suffered, done, or performed, and at all times hereafter, free, discharge, and keep harmless, and indemnified, the said A. B., his heirs, executors, administrators, from all and every such accounts, debts, judgments, and demands, and from all actions, suits, and damages, that may to him or them arise, by reason of the non-payment thereof; and, moreover, that he, the said C. B., his heirs, executors, and administrators, shall and will yearly, and every year, during the term of the natural life of the said A. B., by four equal quarterly payments, the first to begin on the —— day of —— next, well and truly pay, or cause to be paid, to the said A. B., or his assigns, the sum of ——, for, or toward his support and maintenance, or find or provide for him sufficient meat, drink, washing, lodging, apparel, and attendance, suitable to his state and situation, at the choice and election, from time to time, of the said A. B.

Provided always, and upon this condition, and it is the true intent and meaning of these presents, that if the said C. B., his heirs, executors, and administrators, shall neglect or refuse to pay the said accounts, debts, judgments, and demands, according to his covenant aforesaid, or shall suffer the said A. B. to be put to any cost, charge, trouble, or expense, on account of the same, or shall neglect or refuse to pay the said annual sum, in manner aforesaid, or to find and provide for the said A. B., as aforesaid, that then, in all, any, or either of the cases aforesaid, it shall and may be lawful to and for the said A. B., all and singular, the premises hereby granted to take, repossess, and enjoy, as in his former estate.

In witness, etc. [*as in General Form of Agreement*].

A WILL OF REAL ESTATE

IN the name of God, Amen. I, A. C., being of sound and disposing mind and memory, and considering the uncertainty of this life, do make, publish, and declare this to be my last will and testament, as follows: First, after my lawful debts are paid, I give and bequeath unto my beloved wife, J. C., the sum of ——. *Item*, I give and bequeath to my eldest son, G. C., the sum of ——. *Item*, I give and bequeath unto my two youngest sons, J. C. and F. C., the sum of —— each. *Item*, I give and bequeath to my daughter-in-law, S. H., widow, the sum of ——; which said several legacies or sums of money I will and order to be paid to the said respective legatees, within six months after my decease. I further give and devise to my said eldest son G. C., his heirs, and assigns, all that messuage or tenement, situated, lying, and being in, etc., together with all my other freehold estate whatsoever, to hold to him the said G. C., his heirs and assigns, forever. And I hereby give and bequeath to my said younger sons, J. C. and F. C., all my leasehold estate, of and in all those messuages or tenements, with the appurtenances, situate, etc., equally to be divided between them. And lastly, as to all the rest, residue, and remainder of my personal estate, goods, and chattels, of what kind and nature soever, I give and bequeath the same to my said beloved wife, J. C. I hereby appoint D. L. to be executor of this my last will and testament: hereby revoking all former wills by me made. In witness whereof, I have hereunto subscribed my name, and affixed my seal, the —— day of ——, in the year of our Lord one thousand nine hundred and one.

WITNESSES,
P. N.
L. Y.
O. W.

A. C. [L. S.]

Subscribed by the testator named in the foregoing will, in the presence of each of us, and at the time of making such subscription the above instrument was declared by the said testator to be his last will and testament, and each of us, at the request of said testator and in his presence and in the presence of each other, sign our names as witnesses thereto, at the end of the will.

P. N., residing at ——, in —— County.
L. Y., residing at ——, in —— County.
O. W., residing at ——, in —— County.

CODICIL TO A WILL

WHEREAS, I, A. C., of, etc., have made my last will and testament in writing, bearing date, etc. [and have thereby, etc.]. Now I do by this my writing, which I hereby declare to be a codicil to my said will, to be taken as a part thereof [will and direct, etc.], give and bequeath to my niece M. S., one gold watch, one large diamond ring, and one silver coffee-pot. And whereas, in and by my last will and testament, I have given and bequeathed to my daughter-in-law, G. H., the sum of ——, I do hereby order and declare, that my will is that only the sum of —— be paid unto her, in full of the said legacy I have as aforesaid given and bequeathed unto her; and that the remaining part of the said legacy be given and paid to my nephew E. G. And lastly, it is my desire that this my present codicil be annexed to, and made a part of my last will and testament, to all intents and purposes.

In witness whereof, I have hereunto set my hand and seal, this —— day of ——, etc.

A. C. [L. S.]

The above instrument was, at the date thereof, declared to us by the testator, A. C., to be a codicil to be annexed to his last will and testament; and

he acknowledged, to each of us, that he had subscribed the same; and we, at his request, sign our names hereto as attesting witnesses.

D. F., residing at ——, in —— County.
G. H., residing at ——, in —— County.

GENERAL FORM, DISPOSING OF BOTH REAL AND PERSONAL ESTATE

In the name of God, Amen. I, A. B., of, etc., being in good bodily health, and of sound and disposing mind and memory, calling to mind the frailty and uncertainty of human life, and being desirous of settling my worldly affairs, and directing how the estates with which it has pleased God to bless me, shall be disposed of after my decease, while I have strength and capacity so to do, do make and publish this my last will and testament, hereby revoking and making null and void all other last wills and testaments by me heretofore made. And, first, I commend my immortal being to Him who gave it, and my body to the earth, to be buried with little expense or ostentation, by my executors hereinafter named.

And as to my worldly estate, and all the property, real, personal, or mixed, of which I shall die seized and possessed, or to which I shall be entitled at the time of my decease, I devise, bequeath, and dispose thereof in the manner following, to wit:

Imprimis. My will is, that all my just debts and funeral charges shall, by my executors hereinafter named, be paid out of my estate, as soon after my decease as shall by them be found convenient.

Item. I give, devise, and bequeath to my beloved wife, C. B., all my household furniture, and my library in my mansion or dwelling-house, my pair of horses, coach, and chaise, and their harnesses; and also fifteen thousand dollars, in money, to be paid to her by my executors hereinafter named, within six months after my decease: To have and to hold the same to her, and her executors, administrators, and assigns, forever. I also give to her the use, improvement, and income of my dwelling-house, land, and its appurtenances, situated in ——, my warehouse, land, and its appurtenances, situated in ——, to have and to hold the same to her for and during her natural life.

Item. I give and bequeath to my honored mother, O. B., two thousand dollars, in money, to be paid to her by my executors hereinafter named, within six months after my decease; to be for the sole use of herself, her heirs, executors, administrators, and assigns.

Item. I give, devise, and bequeath to my son, E. B., the reversion or remainder of my dwelling or mansion-house, land, and its appurtenances, situated in ——, and all profit, income, and advantage that may result therefrom, from and after the decease of my beloved wife, C. B.: To have and to hold the same to him, the said E. B., his heirs and assigns, from and after the decease of my said wife, to his and their use and behoof forever.

Item. I give, devise, and bequeath to my son, F. B., the reversion or remainder of my warehouse, land, and its appurtenances, situated in ——, and all the profit, income, and advantage that may result therefrom, from and after the decease of my beloved wife, C. B.: To have and to hold the same to the said F. B., his heirs and assigns, from and after the decease of my said wife, to his and their use and behoof forever.

Item. All the rest and residue of my estate, real, personal, or mixed, of which I shall die seized and possessed, or to which I shall be entitled at the time of my decease, I give, devise, and bequeath, to be equally divided to and among my said sons, E. B. and F. B. And,

Lastly. I do nominate and appoint my said sons, E. B. and F. B., to be the executors of this my last will and testament.

In testimony whereof, I, the said A. B., have to this my last will and testament subscribed my name, and affixed my seal, this —— day of ——, in the year of our Lord one thousand nine hundred and ——. A. B. [L. s.]

This will must be attested in the same manner as in the preceding forms.

DEVISE FROM A HUSBAND TO HIS WIFE, OF AN ESTATE FOR LIFE, IN LIEU OF DOWER; REMAINDER TO HIS CHILDREN AS TENANTS IN COMMON

Item. I give and devise unto my said wife, all that my said messuage or tenement, with the appurtenances, situate, etc., with the lands and hereditaments thereunto belonging, and the rents, issues, and profits thereof, for and during the term of her natural life; and from and after the decease of my said wife, I give and bequeath the said messuage or tenement, lands, and hereditaments, unto such child or children, as I shall leave or have living at the time of my decease, and to their heirs and assigns forever, as tenants in common, and if I shall have no such child or children, etc., then I give and devise, etc., which said legacy given to my said wife as aforesaid, I hereby declare is intended to be, and is so given to her, in full satisfaction and recompense of, and for her dower and thirds, which she may, or can in any wise claim or demand out of my estate.

Item. I give and devise all the rest and residue of my estate, both real and personal (not hereinbefore by me given and bequeathed), unto, etc.

MORTGAGE OF LANDS BY HUSBAND AND WIFE

This Indenture, made the —— day of ——, in the year of our Lord one thousand nine hundred and ——, between F. F., of the city of New York, merchant, and J., his wife, of the first part, and L. M., of said city, merchant, of the second part, *witnesseth:* That the said parties of the first part, for and in consideration of the sum of ——, lawful money of the United States, to them in hand paid, the receipt whereof is hereby acknowledged, have granted, bargained, sold, aliened, released, conveyed, and confirmed, and by these presents do grant, bargain, sell, alien, release, convey, and confirm, unto the said party of the second part, and to his assigns forever, all that certain lot, etc. [here follows description as to boundaries, length of lines, etc.]; together with all and singular the hereditaments and appurtenances thereunto belonging, or in any wise appertaining, and the reversion and reversions, remainder and remainders, rents, issues, and profits thereof; and also all the estate, right, title, interest, dower, possession, claim, and demand whatsoever, of the said parties of the first part, of, in, and to the same, and every part thereof, with the appurtenances: To have and to hold the said hereby granted premises, with the appurtenances, unto the said party of the second part, his heirs and assigns, to his and their only proper use, benefit, and behoof forever. Provided always, and these presents are upon this condition, that if the said parties of the first part, their heirs, executors, administrators, or assigns, shall pay unto the said party of the second part, his executors, administrators, or assigns, the sum of ——, on or before the —— day of ——, which will be in the year ——, with interest, according to the condition of a bond of the said F. F., to the said L. M., bearing even date herewith, then these presents shall become void, and the estate hereby granted shall cease and utterly determine. But if default shall be made in the payment of the said sum of money, or the interest, or of any part thereof, at the time hereinbefore specified for the payment thereof, the said parties of the first part, in such case, do hereby authorize and fully empower the said party of the second part, his executors, administrators, and assigns, to sell the said hereby granted premises, at public auction, and convey the same to the purchaser, in fee simple, agreeably to the act in such case made and provided, and out of the moneys arising from such sale, to retain the principal and interest which shall then be due on the said bond, together with all costs and charges, and pay the overplus (if any) to the said F. F., party of the first part, his heirs, executors, administrators, or assigns.

In witness whereof, the parties to these presents

have hereunto set their hands and seals, the day and year first above written.

Sealed and delivered in the presence of JOHN SMITH. } JULIA FOREST. [L. S.] FRANCIS FOREST. [L. S.]

A MORTGAGE GIVEN FOR PART OF THE PURCHASE MONEY OF LAND

THIS Indenture, made the —— day of ——, in the year of our Lord ——, between A. B., of the city of New York, merchant, of the first part, and R. T., of the said city, esquire, of the second part, *witnesseth:* That the said party of the first part, for and in consideration of the sum of three thousand dollars, lawful money of the United States, to him in hand paid, the receipt whereof is hereby acknowledged, hath granted, bargained, sold, aliened, released, conveyed, and confirmed, and by these presents doth grant, bargain, sell, alien, release, convey, and confirm, unto the said party of the second part, and to his heirs and assigns forever, all those three certain lots, pieces, and parcels of land, situate, lying, and being, etc. [here follows precise descriptions as to boundaries, dimensions, etc.]; the said three lots of land being part of the premises this day conveyed to the said A. B. by the said R. T. and his wife, and these presents are given to secure the payment of part of the consideration money of the said premises; together with all and singular the hereditaments and appurtenances thereunto belonging, or in any wise appertaining, and the reversion and reversions, remainder and remainders, rents, issues, and profits thereof, and also, all the estate, right, title, interest, dower, possession, claim, and demand whatsoever, of the said party of the first part, of, in, and to these same, and every part thereof, with the appurtenances. To have and to hold the said hereby granted premises, with the appurtenances, unto the said party of the second part, his heirs and assigns, to his and their only proper use, benefit, and behoof forever. Provided always, and these presents are upon this condition, that if the said party of the first part, his heirs, executors, administrators, and assigns, shall pay unto the said party of the second part, his executors, administrators, or assigns, the sum of three thousand dollars, lawful money aforesaid, on or before the —— day of —— next, with interest thereon at the rate of six per cent per annum, payable half yearly, on the first days of May and November in each year, until the whole principal sum shall be fully paid and satisfied, according to the condition of the bond of the said A. B. to the said R. T., bearing even date herewith, then these presents, and the estate hereby granted, shall cease and be void. And if default be made in the payment of the said sum of money, or the interest, or of any part thereof, at the time hereinbefore specified for the payment thereof, the said party of the first part in each case does hereby authorize and fully empower the said party of the second part, his executors, administrators, and assigns, to sell the said hereby granted premises at public auction, and convey the same to the purchaser, in fee simple, according to law, and out of the moneys arising from such sale to retain the principal and interest which shall then be due on the said bond, together with all the costs and charges, and the overplus (if any) pay to the said party of the first part, his heirs, executors, administrators, and assigns. And it is also agreed, by and between the parties to these presents, that until the payment of the said principal and interest moneys in full, it shall be lawful for the party of the second part, his executors, administrators, or assigns, to keep the buildings erected, or to be erected, upon the lands above conveyed, insured against loss or damage by fire, and these presents shall operate to secure the repayment of the premium or premiums paid for effecting or continuing such insurance.

In witness, etc. [*as in Mortgage of Lands by Husband and Wife*].

MORTGAGE ON GOODS OR CHATTELS

To all to whom these presents shall come: Know ye, that I, A. B., of ——, party of the first part, for securing the payment of the money hereinafter mentioned, and in consideration of the sum of one dollar to me duly paid by C. D. of ——, of the second part, at or before the ensealing and delivery of these presents, the receipt whereof is hereby acknowledged, having bargained and sold, and by these presents do grant, bargain, and sell unto the said party of the second part, two bay horses, and all other goods and chattels mentioned in the schedule hereunto annexed, and now in the possession of ——; to have and to hold all and singular the goods and chattels above bargained and sold, or intended so to be, unto the said party of the second part, his executors, administrators, and assigns, forever. And I, the said party of the first part, for myself, my heirs, executors, and administrators, all and singular, the said goods and chattels above bargained and sold unto the said party of the second part, his heirs, executors, administrators, and assigns, against me, the said party of the first part, and against all and every person or persons whomsoever, shall and will warrant and forever defend; upon condition, that if I, the said party of the first part, shall and do well and truly pay unto the said party of the second part, his executors, administrators, or assigns, the full sum of —— dollars, on the —— day of —— next, according to the tenor and effect of a certain promissory note, bearing even date herewith, made by me in favor of the said C. D., then these presents shall be void. And I, the said party of the first part, for myself, my executors, administrators, and assigns, do covenant and agree, to and with the said party of the second part, his executors, administrators, and assigns, that in case default shall be made in the payment of the said sum above mentioned, then it shall and may be lawful for, and I, the said party of the first part, do hereby authorize and empower the said party of the second part, his executors, administrators, and assigns, with the aid and assistance of any person or persons, to enter my dwelling-house, store, and other premises, and such other place or places as the said goods or chattels are, or may be placed, and take and carry away the said goods and chattels, and to sell and dispose of the same for the best price they can obtain; and out of the money arising therefrom, to retain and pay the said sum above mentioned, and all charges touching the same, rendering the overplus (if any) unto me, or to my executors, administrators, or assigns. And until default be made in the payment of the said sum of money, I am to remain and continue in the quiet and peaceable possession of the said goods and chattels, and the full and free enjoyment of the same.

In witness, etc. [*as in Mortgage of Lands by Husband and Wife*].

POWER OF ATTORNEY TO COLLECT DEBTS

KNOW all men by these presents, that I, A. B., of ——, have constituted, made, and appointed, and by these presents do constitute, make, and appoint T. U., of ——, to be my true and lawful attorney, for me and in my name and stead, and to my use, to ask, demand, sue for, levy, recover, and receive, all such sum and sums of money, debts, rents, goods, wares, dues, accounts, and other demands whatsoever, which are or shall be due, owing, payable, and belonging to me, or detained from me, in any manner of ways or means whatsoever, by I. K., his heirs, executors, and administrators, or any of them, giving and granting unto my said attorney, by these presents, my full and whole power, strength, and authority, in and about the premises, to have, sue, and take all lawful ways and means, in my name, for the recovery thereof; and upon the receipt of any such debts, dues, or sums of money aforesaid, acquittances, or other sufficient discharges, for me and in my name to make, seal, and deliver; and generally all and

every other act and acts, thing and things, device and devices, in the law whatsoever, needful and necessary to be done in and about the premises, for me and in my name to do, execute, and perform, as largely and amply, to all intents and purposes, as I might or could do, if personally present, or as the matter required more special authority than is herein given; and attorneys, one or more under him, for the purpose aforesaid, to make and constitute, and again at pleasure to revoke, ratifying, allowing, and holding, for firm and effectual, all and whatsoever my said attorney shall lawfully do in and about the premises, by virtue hereof.

In witness, etc. [*as in Power of Attorney to Sell and Lease Lands*].

POWER TO RECEIVE A LEGACY

KNOW all men by these presents, that whereas A. B., late of ——, deceased, by his last will and testament did give and bequeath unto me, C. D., of ——, a legacy of ——, to be paid unto me on ——, of which said will E. F., of ——, and C. H., of ——, are joint executors as in and by the said will may appear: now know ye, that I, the said C. D., have made, ordained, constituted, and appointed J. K., of ——, my true and lawful attorney, for me and in my name, and for my use and benefit, to ask, demand, and receive, of and from the said E. F. and G. H., the legacy given and bequeathed unto me, the said C. D., by the said will of the said A. B., as aforesaid; and upon receipt thereof by, or payment thereof to, my said attorney, a general release or discharge for the same to make, execute, and deliver; hereby ratifying, confirming, and allowing whatsoever my said attorney shall lawfully do in the premises.

In witness, etc.

STOCK POWER

KNOW all men by these presents, that I, A. B., of ——, do hereby make, constitute, and appoint C. D., of ——, my true and lawful attorney, for me and in my name to sell, transfer, and assign —— shares of capital stock, standing in my name on the books of the Merchants' Bank in the city of ——, with power also an attorney or attorneys under him for that purpose to make and substitute, with like power, and to do all lawful acts requisite for effecting the premises; hereby ratifying and confirming all that my said attorney or his substitute or substitutes shall do therein by virtue of these presents.

In witness, etc.

TRANSFER OF STOCK

KNOW all men by these presents, that I, C. D., of ——, for value received, have bargained, sold, assigned, and transferred, and by these presents do bargain, sell, assign, and transfer unto E. F., —— shares of capital stock, standing in my name on the books of the Merchants' Bank in the city of ——, and do hereby constitute and appoint A. B., of ——, my true and lawful attorney, irrevocable for me and in my name and stead, but to his use, to sell, assign, transfer, and set over all or any part of the said stock, and for that purpose to make and execute all necessary acts of assignment and transfer, and one or more persons to substitute with like full power; hereby ratifying and confirming all that my said attorney, or his substitute or substitutes, shall lawfully do by virtue hereof.

In witness, etc.

POWER TO RECEIVE DIVIDEND

KNOW all men by these presents, that I, A. B., of ——, do authorize, constitute, and appoint C. D. to receive from the cashier of the Merchants' Bank of ——, the dividend now due to me on all stock standing to my name on the books of the said company, and receipt for the same; hereby ratifying and confirming all that may lawfully be done in the premises by virtue hereof.

In witness, etc.

GENERAL RELEASE OF ALL DEMANDS

KNOW all men by these presents, that I, A. B., of, etc., for and in consideration of the sum of ——, to me paid by C. D., of, etc. (the receipt whereof I do hereby acknowledge), have remised, released, and forever discharged, and I do hereby, for myself, my heirs, executors, administrators, and assigns, remise, release, and forever discharge the said C. D., his heirs, executors, and administrators, of and from all debts, demands, actions, and causes of action, which I now have, in law or equity, or which may result from the existing state of things, from any and all contracts, liabilities, doings, and omissions, from the beginning of the world to this day.

In testimony whereof, I have hereunto set my hand and seal, this sixteenth day of May, nineteen hundred and one.

JOHN SMITH. [L.S.]

AGREEMENT FOR A LEASE

THIS agreement, made the —— day of ——, in the year nineteen hundred and one, between A. B. of ——, and C. D. of said city, merchant, *witnesseth*, That A. B. agrees, by indenture, to be executed on or before the —— day of —— next, to demise and let to the said C. D. a certain house and lot in said city, now or late in the occupation of E. F., known as No. —, in —— street, to hold to the said C. D., his executors, administrators, and assigns, from the —— day of ——, aforesaid, for and during the term of three years, at or under the clear yearly rent of —— dollars, payable quarterly, clear of all taxes and deductions except the ground rent. In which lease there shall be contained covenants on the part of the said C. D., his executors, administrators, and assigns, to pay the rent (except in case the premises are destroyed by fire, the rent is to cease until they are rebuilt by the said A. B.), and to pay all taxes and assessments (except the ground rent); to repair the premises (except damages by fire); not to carry on any offensive business on the same (except by written permission of the said A. B.); to deliver the same up at the end of the term, in good repair (except damages by fire, aforesaid); with all other usual and reasonable covenants, and a proviso for the re-entry of the said C. D., his heirs and assigns, in case of the non-payment of the rent for the space of fifteen days after either of the said rent-days, or the non-performance of any of the covenants. And there shall also be contained covenants on the part of the said A. B., his heirs and assigns, for quiet enjoyment; to renew said lease, at the expiration of said term, for a further period of twenty-one years at the same rent, on the said C. D., his executors, administrators, or assigns, paying the said A. B., his executors, administrators, or assigns, the sum of five hundred dollars, as a premium for such renewal; and that in case of accidental fire, at any time during the term, the said A. B. will forthwith proceed to put the premises in as good repair as before such fire, the rent in the meantime to cease. And the said C. D. hereby agrees to accept such lease on the terms aforesaid. And it is mutually agreed, that the cost of this agreement, and of making and recording said lease, and a counterpart thereof, shall be borne by the said parties equally:

As witness our hands and seals, the day and year first above written.

In presence of } C. D. [L. s.]
J. S. } A. B. [L. s.]

LANDLORD'S AGREEMENT OF LEASE

THIS is to certify, that I have, this —— day of ——, 1901, let and rented unto Mr. C. D. my house and lot, known as No. —, in —— street, in the

city of ——, with the appurtenances, and the sole and uninterrupted use and occupation thereof, for one year, to commence the —— day of —— next, at the yearly rent of —— dollars, payable quarterly, on the usual quarter-days; rent to cease in case the premises are destroyed by fire.

A. B.

TENANT'S AGREEMENT

THIS is to certify, that I have hired and taken from Mr. A. B. his house and lot, known as No. —, in —— street, in the city of——, with the appurtenances, for the term of one year, to commence the first day of —— next, at the yearly rent of —— dollars, payable quarterly on the usual quarter-days. And I do hereby promise to make punctual payment of the rent in manner aforesaid, except in case the premises become untenantable from fire or any other cause, when the rent is to cease; and do further promise to quit and surrender the premises, at the expiration of the term, in as good state and condition as reasonable use and wear thereof will permit, damages by the elements excepted.

Given under my hand and seal, the —— day of ——, 1901.

In presence of } C. D. [L. S.]
J. S. }

SECURITY FOR RENT

IN consideration of the letting of the premises above described, and for the sum of one dollar, I do hereby become surety for the punctual payment of the rent, and performance of the covenants in the above written agreement mentioned, to be paid and performed by C. D., as therein specified and expected; and if any default shall be made therein I do hereby promise and agree to pay unto Mr. A. B. such sum or sums of money as will be sufficient to make up such deficiency, and fully satisfy the conditions of the said agreement, without requiring any notice of non-payment or proof of demand being made.

Given, etc. [*as in Tenant's Agreement*].

TENANT'S AGREEMENT FOR A HOUSE, EMBRACING A MORTGAGE OF HIS CHATTELS

THIS is to certify, that I, A. B., have hired and taken from C. D., the premises known as No. —, in —— street, in the city of New York, for the term of one year from the first day of May next, at the yearly rent of six hundred dollars, payable quarterly. And I hereby promise to make punctual payment of the rent in manner aforesaid, and quit and surrender the premises at the expiration of said term, in as good state and condition as reasonable use and wear thereof will permit, damages by the elements excepted; and engage not to let or underlet the whole or any part of the said premises, or occupy the same for any business deemed extra-hazardous on account of fire, without the written consent of the landlord, under the penalty of forfeiture and damages. And I do hereby mortgage and pledge all the personal property, of what kind soever, which I shall at any time have on said premises, and whether exempt by law from distress for rent or sale under execution, or not, to the faithful performance of these covenants, hereby authorizing the said C. D., or his assigns, to distrain upon and sell the same, in case of any failure on my part to perform the said covenants, or any or either of them.

Given, etc.

LANDLORD'S AGREEMENT

THIS is to certify, that I, C. D., have let and rented unto A. B. the premises known as No. —, in —— street, in the city of New York, for the term of one year from the first day of May next, at the yearly rent of six hundred dollars, payable quarterly. The premises are not to be used or occupied for any business deemed extra-hazardous on account of fire, nor shall the same, or any part thereof, be let or underlet, except with the consent of the landlord in writing, under the penalty of forfeiture and damages.

Given, etc.

AGREEMENT FOR PART OF A HOUSE

MEMORANDUM of an agreement entered into, the —— day of ——, 1901, by and between A. B., of ——, and C. D., of, etc., whereby the said A. B. agrees to let, and the said C. D. agrees to take, the rooms, or apartments following, that is to say: an entire first floor and one room in the attic story or garret, and a back kitchen and cellar opposite, with the use of the yard for drying linen, or beating carpets or clothes, being part of a house and premises in which the said A. B. now resides, situate and being in No. —, in —— street, in the city of ——, to have and to hold the said rooms and apartments, and the use of the said yard as aforesaid, for and during the term of half a year, to commence from the —— day of ——, instant, at and for the yearly rent of —— dollars, lawful money of the United States, payable monthly, by even and equal portions, the first payment to be made on the —— day of —— next ensuing the date thereof; and it is further agreed that, at the expiration of the said term of half a year, the said C. D. may hold, occupy, and enjoy the said rooms or apartments, and have the use of the said yard as aforesaid, from month to month, for so long a time as the said C. D. and A. B. may and shall agree, at the rent above specified; and that each party be at liberty to quit possession on giving the other a month's notice in writing. And it is also further agreed, that when the said C. D. shall quit the premises, he shall leave them in as good condition and repair as they shall be in on his taking possession thereof, reasonable wear excepted.

Witness, etc.

NOTICE TO QUIT, BY LANDLORD

PLEASE to take notice that you are hereby required to surrender and deliver up possession of the house and lot known as No. — in —— street, in the city of ——, which you now hold of me; and to remove therefrom on the first day of —— next, pursuant to the provisions of the statute relating to the rights and duties of landlord and tenant.

Dated this —— day of ——, 1901.

To Mr. C. D. A. B., Landlord.

NOTICE TO QUIT, BY TENANT

PLEASE to take notice, that on the first day of May next I shall quit possession and remove from the premises I now occupy, known as house and lot No. —, in —— street, in the city of ——.

Dated this —— day of ——, 1901.

To Mr. A. B. Yours, etc., C. D.

THE LIKE WHERE THE COMMENCEMENT OF THE TENANCY IS UNCERTAIN

MR. C. D.—I hereby give you notice to quit, and deliver up on the —— day of —— next the possession of the messuage or dwelling house [*or*, rooms and apartments, *or* farm lands and premises], with the appurtenances, which you now hold of me, situate in the —— of ——, in the county of ——, provided your tenancy originally commenced at that time of the year; or otherwise, that you quit and deliver up the possession of the said messuage, etc., at the end of the year of your tenancy, which shall expire next after the end of one half-year from the time of your being served with this notice.

Dated, etc. [*as in Notice to Quit, by Landlord*].

NOTICE TO THE TENANT EITHER TO QUIT THE PREMISES OR TO PAY DOUBLE VALUE

SIR: I hereby give you notice to quit, and yield up, on the —— day of —— next, possession of the messuage, lands, tenements, and hereditaments, which you now hold of me, situate at —— in the parish of ——, and county of ——, in failure whereof I shall require and insist upon double the value of the said premises, according to the statute in such case made and provided.

Dated, etc. [*as in Notice to Quit, by Landlord*].

OATH OF HOLDING OVER

CITY OF ——, *ss.*

A. B., of said city, merchant, being duly sworn, doth depose and say, that on or about the —— day of ——, the deponent rented unto C. D., of said city, printer, the house and lot known as No. —, in —— street, in said city, for the term of one year from the first day of May then next, which said term has expired, and that the said C. D. or his assigns hold over and continue in the possession of the said premises, without the permission of this deponent.

Sworn before me, this —— day of ——.

A. B.

O. P., Commissioner of Deeds.

ASSIGNMENT

KNOW all men by these presents, that I, A. B., having become insolvent, did, in conjunction with so many of my creditors, residing within the United States, whose debts, in good faith, amount to two-thirds of all the debts owing by me to creditors residing within the United States, present a petition to the Hon. J. P. H., County Judge of —— county [*or*, as the case may be], praying for relief, pursuant to the provisions of the statute authorizing an insolvent debtor to be discharged from his debts; whereupon the said Judge ordered notice to be given to all my creditors to show cause, if any they had, before him, at a certain day and place, why the prayer of the petitioner should not be granted; which notice was duly published, and no good cause appearing to the contrary, he being satisfied that the proceedings were just and fair, and that I had in all things conformed to those matters required by the said statute, directed an assignment of all my estate to be made by me for the benefit of all my creditors. Now, therefore, know ye, that, in conformity to the said direction, I have granted, released, assigned, and set over, and by these presents, do grant, release, assign, and set over, unto J. K., of etc., and L. M., of, etc., assignees nominated to receive the same, all my estate, real and personal, both in law and equity, in possession, reversion, or remainder, and all books, vouchers, and securities relating thereto, to hold the same unto the said assignees, to and for the use of all my creditors.

In witness whereof, I have hereunto set my hand and seal this —— day of ——, in the year one thousand nine hundred and ——.

Sealed and delivered in presence of G. H. } A. B. [L. S.]

NOTE WITH SURETY

$100. NEW YORK, April 12, 1901.

SIX months after date, I promise to pay John Thompson, or order, one hundred dollars, value received.

JOHN BROWN.

GEO. SMITH, Surety.

AN UNNEGOTIABLE NOTE

$1000. NEW YORK, April 10, 1901.

THREE months after date, I promise to pay John Thompson one thousand dollars, for value received.

JAMES FOWLER.

A NEGOTIABLE NOTE

$1000. NEW YORK, April 19, 1901.

THREE months after date, I promise to pay John Thompson, or order, one thousand dollars, for value received.

JAMES FOWLER.

A NOTE, OR DUE BILL, PAYABLE ON DEMAND

$100. CINCINNATI, O., April 14, 1901.

ON demand I promise to pay Charles Jones, or order, one hundred dollars, for value received.

HENRY WARING, 120 State Street.

A NOTE BEARING INTEREST

$100. NEW ORLEANS, LA., May 1, 1901.

SIX months after date, I promise to pay George Robinson, or order, one hundred dollars, with interest, for value received.

PHILIP REDMOND.

A NOTE PAYABLE BY INSTALMENTS

$3000. PHILADELPHIA, PA., April 20, 1901.

FOR value received, I promise to pay Smith & Brown, or order, three thousand dollars, in the manner following, viz.: one thousand dollars in one year, one thousand dollars in two years, and one thousand dollars in three years, with interest on all said sums, payable semi-annually, without defalcation or discount.

HUGH FAULKNER, 120 Chestnut Street.

SEALED NOTE

$5000. CLEVELAND, O., May 8, 1901.

FOR value received, I promise to pay Smith & Edgar, or order, five thousand dollars, in three years from the date hereof, with interest, payable semi-annually, without defalcation or discount. And in case of default of my payment of the interest or principal aforesaid with punctuality, I hereby empower any attorney-at-law, to be appointed by said Smith & Edgar, or their assigns, to appear in any court which said Smith & Edgar, or their assigns, may select, and commence and prosecute a suit against me on said note, to confess judgment for all and every part of the interest or principal on said note, in the payment of which I may be delinquent.

Witness my hand and seal, this 8th day of May, A. D. 1901.

JOHN DREW. [SEAL.]

Attest, GEORGE WHITE.

DUE BILL, PAYABLE IN GOODS

DUE John Jones, or bearer, fifty dollars in merchandise, for value received, payable on demand.

THOMAS BOLAND.

NEW YORK, May 3, 1901.

ORDER FOR GOODS

MR. J. TONGUE. NEW YORK, April 16, 1901.

PLEASE pay John Jones, or order, one hundred dollars in merchandise, and charge the same to account of

HENRY WALFORD.

BILL OF EXCHANGE

$1000. HARTFORD, CONN., April 20, 1901.

THIRTY days after sight, pay to the order of Messrs. John Smith & Co. one thousand dollars, and charge the same to account of

RICHARD JAY.

To Messrs. WILSON & RIVERS, New York.

A SET OF BILLS OF EXCHANGE

NEW YORK, April 26, 1901.

No. 188.—Ex. £300.

THREE days after sight of this, my first of exchange (second and third unpaid), pay to Charles Walker, or order, three hundred pounds sterling, value received, and charge the same to account of

JOHN SMITH.

NEW YORK, April 26, 1901.

No. 188.—Ex. £300.

THREE days after sight of this, my second of exchange (first and third unpaid), pay to Charles Walker, or order, three hundred pounds sterling, value received, and charge the same to account of

JOHN SMITH.

NEW YORK, April 8, 1901.

No. 188.—Ex. £300.

THREE days after sight of this, my third of exchange (first and second unpaid), pay to Charles Walker, or order, three hundred pounds sterling, value received, and charge the same to account of

JOHN SMITH.

MONEY ORDER

NEW YORK, May 20, 1901.

MR. HENRY DENHIS:

PLEASE pay Charles Robinson, or order, one hundred dollars, and charge the same to account of

JOSEPH DOYLE.

NOTICE OF NON-PAYMENT

TO BE GIVEN TO THE DRAWER AND INDORSERS

NEW YORK, Feb. 26, 1901.

PLEASE to take notice, that a certain bill of exchange, dated ——, for $1000, drawn by ——, on and accepted by ——, of —— and by you indorsed, was this day protested for non-payment, and the holders look to you for the payment thereof.

Yours, etc.,

To Mr. A. B. J. T., Notary Public.

RECEIPT IN FULL OF ALL DEMANDS

$500. NEW YORK, March 28, 1901.

RECEIVED of John Smith five hundred dollars, in full of all demands against him.

WM. JONES.

RECEIPT ON ACCOUNT

$100. NEW YORK, March 28, 1901.

RECEIVED of John Smith one hundred dollars, to apply on account.

WM. JONES.

RECEIPT FOR MONEY PAID FOR ANOTHER

$100. NEW YORK, March 28, 1901.

RECEIVED of J. G. Wells one hundred dollars, in full of all demands against John Smith.

WM. JONES.

GENERAL FORM OF ASSIGNMENT

TO BE WRITTEN OR INDORSED ON THE BACK OF ANY INSTRUMENT

KNOW all men by these presents, that I, the within-named A. B., in consideration of one hundred dollars to me paid by C. D., have assigned to the said C. D., and his assigns, all my interest in the within written instrument, and every clause, article, or thing therein contained; and I do hereby constitute the said C. D., my attorney, in my name, but to his own use, and at his own risk and cost, to take all legal measures which may be proper for the complete recovery and enjoyment of the assigned premises, with power of substitution.

In testimony whereof, I have hereunto set my hand and seal, this tenth day of May, one thousand nine hundred and one.

Executed and delivered in the presence of

A. B. [SEAL.]

ASSIGNMENT OF A LEASE

KNOW all men by these presents, that I, the within-named A. B., the lessee, for and in consideration of the sum of one thousand dollars, to me in hand paid by C. D., of, etc., at and before the sealing and delivery hereof (the receipt whereof I do hereby acknowledge), have granted, assigned, and set over, and by these presents do grant, assign, and set over, unto the said C. D., his executors, administrators, and assigns, the within indenture of lease, and all that messuage, etc., thereby demised, with the appurtenances; and also all my estate, right, title, term of years yet to come, claim, and demand whatsoever, of, in, to, or out of the same. To have and to hold the said messuage, etc., unto the said C. D., his executors, administrators, and assigns, for the residue of the term within mentioned, under the yearly rent and covenants within reserved and contained, on my part and behalf to be done, kept, and performed.

In testimony, etc. [*as in General Form of Assignment*].

ASSIGNMENT OF A MORTGAGE

KNOW all men by these presents, that I, A. B., the mortgagee within named, for and in consideration of the sum of sixteen hundred dollars, to me paid by C. D., of, etc., at and before the sealing and delivery hereof (the receipt whereof is hereby acknowledged), have granted, bargained, sold, assigned, and set over, and by these presents do grant, bargain, sell, assign, and set over, unto the said C. D., his heirs, executors, administrators, and assigns, the within deed of mortgage, and all my right and title to that messuage, etc., therein mentioned and described, together with the original debt for which the said mortgage was given, and all evidence thereof, and all the rights and appurtenances thereunto belonging. To have and to hold all and singular the premises hereby granted and assigned, or mentioned, or intended so to be, unto the said C. D., his heirs and assigns, forever; subject, nevertheless, to the right and equity of redemption of the within named E. F., his heirs and assigns (if any they have), in the same.

In testimony, etc. [*as in General Form of Assignment*].

ASSIGNMENT OF A PATENT

WHEREAS, letters patent, bearing date —— day of ——, in the year ——, were granted and issued by the government of the United States, under the seal thereof, to A. B., of the town of ——, in the county of ——, in the State of ——, for [here state the nature of the invention in general terms, as in the patent], a more particular and full description whereof is annexed to the said letters patent in a schedule; by which letters patent the full and exclusive right and liberty of making and using the said invention, and of vending the same to others to be used, was granted to the said A. B., his heirs, executors, and administrators, or assigns, for the term of fourteen years from the said date:

Now know all men by these presents, that I, the said A. B., for and in consideration of the sum of —— dollars, to me in hand paid (the receipt whereof is hereby acknowledged), have granted, assigned, and set over, and by these presents do grant, assign, and set over, unto C. D., of the town of ——, in the county of ——, and State of ——, his executors, administrators, and assigns, forever, the said letters patent, and all my right, title, and interest, in and to the said invention, so granted unto me: To have and to hold the said letters patent and invention, with all benefit, profit, and advantage thereof, unto the said C. D., his executors, administrators, and assigns, in as full, ample, and beneficial a manner, to all intents and purposes, as I, the said A. B., by virtue of the said letters patent, may or might have or hold the same, if this assignment had not been made, for and during all the rest and residue of the said term of fourteen years.

In testimony, etc., [*as in General Form of Assignment*].

ASSIGNMENT OF A POLICY OF INSURANCE

KNOW all men by these presents, that I, the within-named A. B., for and in consideration of the sum of ——, to me paid by C. D., of, etc. (the receipt whereof is hereby acknowledged), have granted, sold, assigned, transferred, and set over, and by these presents I do absolutely grant, sell, assign, transfer, and set over to him, the said C. D., all my right, property, interest, claim, and demand in and to the within policy of insurance, which have already arisen, or which may hereafter arise thereon, with full power to use my name so far as may be necessary to enable him fully to avail himself of the interest herein assigned, or hereby intended to be assigned. The conveyance herein made, and the powers hereby given, are for myself and my legal representatives to said C. D. and his legal representatives.

In testimony, etc. [*as in General Form of Assignment*].

ASSIGNMENT OF DEMAND FOR WAGES OR DEBT

IN consideration of $100 to me in hand paid by M. D., of the city of ——, the receipt whereof is hereby acknowledged, I, L. C., of the same place, have sold, and by these presents do sell, assign, transfer, and set over, unto the said M. D., a certain debt due from N. E., amounting to the sum of $150, for work, labor, and services, by me performed for the said N. E. (or for goods sold and delivered to the said N. E.), with full power to sue for, collect, and discharge, or sell and assign the same in my name or otherwise, but at his own cost and charges; and I do hereby covenant that the said sum of $150 is justly due as aforesaid, and that I have not done and will not do any act to hinder or prevent the collection of the same by the said M. D.

Witness my hand, this April 10, 1901.

L. C.

ASSIGNMENT OF ACCOUNT INDORSED THEREON

IN consideration of $1, value received, I hereby sell and assign to M. D. the within account which is justly due from the within named N. E., and I hereby authorize the said M. D. to collect the same.

L. C.

Troy, April 10, 1901.

BOND TO A CORPORATION

KNOW all men by these presents, that I, A. B., of, etc., am held and firmly bound unto the —— Insurance Company, in the sum of one thousand dollars, lawful money of the United States, to be paid to the said —— Insurance Company or assigns; for which payment, well and truly to be made, I bind myself, my heirs, executors, and administrators, firmly by these presents.

Sealed with my seal. Dated the —— day of ——, one thousand nine hundred and ——.

The condition of the above obligation is such, that if the above bounden A. B., his heirs, executors, or administrators, shall well and truly pay, or cause to be paid unto the above named —— Insurance Company, or assigns, the just and full sum, etc. [*as in Common Bond*].

COMMON CHATTEL MORTGAGE

THIS Indenture, made the —— day of, etc., between A. B., of, etc., of the first part, and C. D., of, etc., of the second part, witnesseth: That the said party of the first part, in consideration of the sum of —— dollars, to him duly paid, hath sold, and by these presents doth grant and convey, to the said party of the second part, and his assigns, the following described goods, chattels, and property [*here describe them, or refer to them thus*, "as in the schedule annexed"], now in my possession, at the —— of —— aforesaid; together with the appurtenances, and all the estate, title, and interest of the said party of the first part therein. This grant is intended as a security for the payment of one hundred and fifty dollars, with interest, on or before the expiration of one year from the date hereof; and the additional sum of one hundred and sixty dollars, with interest, on the —— day of ——, 19—; which payments, if duly made, will render this conveyance void.

In witness, etc. [*as in Bill of Sale and Chattel Mortgage*].

CIVIL SERVICE RULES

IN the exercise of the power vested in the President by the Constitution, and by virtue of the 1,753d section of the Revised Statutes, and of the civil service act approved January 16, 1883, the following rules for the regulation and improvement of the executive civil service are hereby amended and promulgated:

RULE I.—No person in said service shall use his official authority or influence either to coerce the political action of any person or body or to interfere with any election.

RULE II.—No person in the public service shall for that reason be under any obligation to contribute to any political fund, or to render any political service, and he will not be removed or otherwise prejudiced for refusing to do so.

RULE III.—It shall be the duty of collectors, postmasters, assistant treasurers, naval officers, surveyors, appraisers, and custodians of public buildings, at places where examinations are to be held, to allow and arrange for the reasonable use of suitable rooms in the public buildings in their charge, and for heating, lighting, and furnishing the same, for the purposes of such examinations; and all other executive officers shall in all legal and proper ways facilitate such examinations and the execution of these rules.

RULE IV.—1. All officials connected with any office where, or for which, any examination is to take place, will give the Civil Service Commission, and the chief examiner, such information as may be reasonably required to enable the Commission to select competent and trustworthy examiners; and the examinations by those selected as examiners, and the work incident thereto, will be regarded as a part of the public business to be performed at such office.

2. It shall be the duty of every executive officer promptly to inform the Commission, in writing, of the removal or discharge from the public service of any examiner in his office, or of the inability or refusal of any such examiner to act in that capacity.

RULE V.—There shall be five branches of the service, classified under the civil service act (not including laborers or workmen, or officers required to be confirmed by the Senate), as follows:

1. Departmental Branch.
2. Custom-House Branch.
3. Post-Office Branch.
4. Government Printing Branch.
5. Internal Revenue Branch.

The Custom-House Branch includes all officers and employees who have been, or may hereafter be, classified, who are serving in any customs district.

The Post-Office Branch includes all officers and employees who have been, or may hereafter be, classified, who are serving in any free-delivery post-office.

The Government Printing Branch includes all positions in the Government Printing Office except those of Public Printer, and *unskilled* laborers or workmen.

The Internal-Revenue Branch includes all officers and employees in any internal-revenue district who have been, or may hereafter be, classified under the civil-service act.

RULE VI.—1. There shall be open, competitive examinations for testing the fitness of applicants for admission to the service. Such examinations shall be practical in their character, and, so far as may be, shall relate to those matters which will fairly test the relative capacity and fitness of the persons examined to discharge the duties of the branch of the service which they seek to enter.

2. There shall, so far as they may be deemed useful, be competitive examinations of a suitable character to test the fitness of persons for promotion in the service.

RULE VII.—1. The general examinations under the first clause of Rule VI for admission to the service shall be limited to the following subjects: 1st. Orthography, penmanship, and copying. 2d. Arithmetic—fundamental rules, fractions, and percentage. 3d. Interest, discounts, and elements of book-keeping and of accounts. 4th. Elements of the English language, letter-writing, and the proper construction of sentences. 5th. Elements of the geography, history, and government of the United States.

2. Proficiency in each of these subjects shall be credited in grading the standing of the persons examined in proportion to the value of a knowledge of such subjects in the branch or part of the service which the applicant seeks to enter.

3. No one shall be entitled to be certified for appointment whose standing upon a just grading in the general examination shall be less than sixty-five per centum of complete proficiency in the first three subjects mentioned in this rule, and the measure of proficiency shall be deemed adequate.

4. For places in which a lower degree of education will suffice, the Commission may limit the examinations to less than the five subjects above mentioned; but no person shall be certified for appointment, under this clause, whose grading shall be less than an average of sixty-five per centum on such of the first three subjects or parts thereof as the examination may embrace.

5. The Commission may also order examinations upon other subjects of a technical or special character, to test the capacity which may be needed in any part of the Classified Service which requires peculiar information or skill. Examinations hereunder may be competitive or non-competitive, and the maximum limitations of age contained in the twelfth Rule shall not apply to applicants for the same. The application for, and notice of, these special examinations, the records thereof and the certification of those found competent shall be such as the Commission may provide for. After consulting the head of any Department or office, the Commission may from time to time designate, subject to the approval of the President, the positions therein for which applicants may be required to pass this special examination.

RULE VIII.—No question in any examination, or proceeding by, or under, the Commission or examiners, shall call for the expression or disclosure of any political or religious opinion or affiliation, and if such opinion or affiliation be known, no

discrimination shall be made by reason thereof by the examiners, the Commission, or the appointing power. The Commission and its examiners shall discountenance all disclosure, before either of them, of such opinion by or concerning any applicant for examination or by or concerning any one whose name is on any register awaiting appointment.

RULE IX.—All regular applications for the competitive examinations for admission to the classified service must be made on blanks in a form approved by the Commission. All requests for such blanks, and all applications for examination, must be addressed as follows: 1. If for the Classified Departmental Service, to the U. S. Civil Service Commission, Washington, D. C. 2. If for the Classified Postal Service, to the postmaster under whom service is sought. 3. If for the Classified Customs Service, to the head of either customs office in which service is sought. All officers receiving such applications will indorse thereon the date of the reception thereof and transmit the same to the proper examining board of the district or office where service is sought, or, if in Washington, to the Civil Service Commission.

RULE X.—Every examining board shall keep such records, and such papers on file, and make such reports as the Commission shall require; and any such paper or record in the charge of any examination board or any officer shall at all times be open to examination as the Commission shall direct, and upon its request shall be forwarded to the Commission for inspection and revision.

RULE XI.—Every application, in order to entitle the applicant to appear for examination or to be examined, must state, under oath, the facts on the following subjects: 1. Full name, residence, and post-office address. 2. Citizenship. 3. Age. 4. Place of birth. 5. Health and physical capacity for the public service. 6. Right of preference by reason of military or naval service. 7. Previous employment in the public service. 8. Business or employment and residence for the previous five years. 9. Education. Such other information shall be furnished as the Commission may reasonably require touching the applicant's fitness for the public service. The applicant must also state the number of members of his family in the public service, and where employed, and must also assert that he is not disqualified under section 8 of the civil service act, which is as follows: "That no person habitually using intoxicating beverages to excess shall be appointed to or retained in any office, appointment, or employment to which the provisions of this act are applicable." No person under enlistment in the Army or Navy of the United States shall be examined under these Rules.

RULE XII.—1. Every regular application must be supported by proper certificates of good moral character, health, and physical and mental capacity for doing the public work, the certificates to be in such form and number as the regulations of the Commission shall provide; but no certificate will be received which is inconsistent with the tenth section of the civil service act.

2. No one shall be entitled to be examined for admission to the Classified Postal Service if under sixteen or over thirty-five years of age; or to the Classified Customs Service, or to the Classified Departmental Service, if under eighteen or over forty-five years of age; but no one shall be examined for appointment to any place in the Classified Customs Service except that of clerk or messenger who is under twenty-one years of age; but these limitations of age shall not apply to persons honorably discharged from the military or naval service of the country, who are otherwise duly qualified.

RULE XIII.—1. The date of the reception of all regular applications for the Classified Departmental Service shall be entered of record by the Commission, and of all other regular applications by the proper examining boards of the district or office for which they are made; and applicants when in excess of the number that can be examined at a single examination shall, subject to the needs of apportionment, be notified to appear, in their order, on the respective records. But any applicants in the several States and Territories for appointment in the Classified Departmental Service may be notified to appear for examination at any place at which an examination is to be held, whether in any State or Territory, or in Washington, which shall be deemed most convenient for them.

2. The Commission is authorized, in aid of the apportionment among the States and Territories, to hold examinations at places convenient for applicants from different States and Territories, or for those examination districts which it may designate and which the President shall approve.

RULE XIV.—Those examined shall be graded, and shall have their grade marked upon a register after those previously thereon, in the order of their excellence as shown by their examination papers, except that those from the same State or Territory may be entered upon the register together, in the order of relative excellence, to facilitate apportionment. Separate registers may be kept of those seeking to enter any part of the service in which special qualifications are required.

RULE XV.—The Commission may give a certificate to any person examined, stating the grade which such a person attained and the proficiency in the several subjects, shown by the markings.

RULE XVI.—1. Whenever any officer having the power of appointment or employment shall so request, there shall be certified to him, by the Commission or the proper examining board, four names for the vacancy specified, to be taken from those graded highest on the proper register of those in his branch of the service and remaining eligible, regard being had to the apportionment of appointments to States and Territories; and from the said four a selection shall be made for the vacancy.

2. These certifications for the service at Washington shall be made in such order as to apportion, as nearly as may be practicable, the original appointments thereto among the States and Territories and the District of Columbia, upon the basis of population as ascertained at the last preceding census.

3. In case the request for any such certification or any law or regulation shall call for those of either sex, the four highest of that sex shall be certified, otherwise sex shall be disregarded in such certification.

4. No person upon any register shall be certified more than four times to the same officer in the customs or postal service, or more than twice to any department at Washington, unless upon request of the appointing officer; nor shall any one remain eligible more than one year upon any register. No person while remaining eligible on any register shall be admitted to a new examination, and no person having failed upon any examination shall within six months thereafter be admitted to another examination without the consent of the Commission. But these restrictions shall not extend to examinations under clause 5 of Rule 7.

5. Any person appointed to or employed in any part of the classified service, after due certification for the same under these rules, who shall be dismissed or separated therefrom without fault or delinquency on his part, may be reappointed or re-employed in the same part or grade of such service at the same office, within eight months next

following such dismissal or separation, without further examination.

RULE XVII.—1. Every original appointment or employment in said classified service shall be for the probationary period of six months, at the end of which time, if the conduct and capacity of the person appointed have been found satisfactory, the probationer shall be absolutely appointed or employed; but, otherwise, be deemed out of the service.

2. Every officer under whom any probationer shall serve during any part of the probation provided for by these rules shall carefully observe the quality and value of the service rendered by such probationer, and shall report to the proper appointing officer, in writing, the facts observed by him, showing the character and qualifications of such probationer, and of the service performed by him; and such reports shall be preserved on file.

3. Every false statement knowingly made by any person in his application for examination, and every connivance by him at any false statement made in any certificate which may accompany his application, shall be regarded as good cause for the removal or discharge of such person during his probation.

RULE XVIII.—Every head of a department or office shall notify the Commission of the name of every person appointed to, or employed in, the classified service under him (giving the date of the appointment and the designation of the office or place) from those examined under the Commission; and shall also inform the Commission of the date of any rejection or final appointment or employment of any probationer, and of the promotion, removal, discharge, resignation, transfer, or death of any such person after probation. Every head of any office in the postal or customs service shall give such information on these subjects to the Board of Examiners for his office as the regulations of the Commission may provide for.

RULE XIX.—There are excepted from examination the following: 1. The confidential clerk or secretary of any head of a department or office. 2. Cashiers of collectors. 3. Cashiers of postmasters. 4. Superintendents of money-order divisions in post-offices. 5. The direct custodians of money for whose fidelity another officer is under official bond; but these exceptions shall not extend to any official below the grade of assistant cashier or teller. 6. Persons employed exclusively in the secret service of the Government, or as translators, or interpreters, or stenographers. 7. Persons whose employment is exclusively professional. 8. Chief clerks, deputy collectors, and superintendents, or chiefs of divisions or bureaus. But no person so excepted shall be either transferred, appointed, or promoted, unless to some excepted place, without an examination under the Commission. Promotions may be made without examination in offices where examinations for promotion are not now held, until rules on the subject shall be promulgated.

RULE XX.—If the failure of competent persons to attend and be examined, or the prevalence of contagious disease or other sufficient cause, shall make it impracticable to supply in due season for any appointment the names of persons who have passed a competitive examination, the appointment may be made of a person who has passed a non-competitive examination, which examination the Commission may provide for; but its next report shall give the reason for such resort to non-competitive examination.

RULE XXI.—1. No person shall be promoted, without examination under these rules, from any position for which an examination is not required to any position for which an examination is required under the rules; nor shall any person who has passed only a limited examination under clause 4 of Rule 7, for the lower classes or grades in the Departmental or Customs Service, be promoted within two years after appointment to any position giving a salary of $1,000, or upward, without first passing an examination under clause 1 of said rule, and such examination shall not be allowed within the first year after appointment.

2. But a person who has passed the examination under said clause 1, and has accepted a position giving a salary of $900 or less, shall have the same right of promotion as if originally appointed to a position giving a salary of $1,000 or more.

3. The Commission may at any time certify for a $900 or any lower place in the classified service any person upon the register who has passed the examination under clause 1 of Rule 7, if such person does not object before such certification is made.

RULE XXII.—The Civil Service Commission will make appropriate regulations for carrying these rules into effect.

RULE XXIII.—Every violation, by any officer in the executive civil service, of these rules, or of the 11th, 12th, 13th, or 14th section of the Civil Service Act, relating to political assessments, shall be good cause for removal.

[Rules 6, 7, 8, 11, 13, 16, 18, and 19 were amended and promulgated Nov. 7. Rule 12 was amended and promulgated Dec. 5, 1883. Rule 16 was amended and promulgated Jan. 18, 1884. Present Rule 21 was promulgated Jan. 18, 1884. Former Rule 21 is now 22; and 22 is Rule 23.]

REGULATIONS

The United States Civil Service Commission, acting under the authority of the Civil Service Act of January 16, 1883, and the rules promulgated by the President, makes the following regulations:

CHIEF EXAMINER

1. The Chief Examiner shall, as far as practicable, except when otherwise directed by the Commission, attend the examinations held by the several boards of examiners. He shall take care to secure accuracy, uniformity, and justice in all their proceedings, which shall at all times be open to him; but leaving the duty of the examiners, in marking and grading those examined, unimpaired. The Commission will, in its discretion, designate one of its own members, or request the detail of a suitable person, to supervise examinations whenever deemed needful.

2. He shall prepare and submit to the approval of the Commission proper forms and questions. He shall take care that the rules and regulations are complied with, and bring every case of injustice and irregularity observed by him to the attention of the Commission. He shall take such part as the Commission shall assign him in the work at Washington. It shall be his duty to confer, from time to time, with the heads of the postal and customs officers which he officially visits, concerning the regularity, sufficiency, and convenience of the examinations for the service under them.

SECRETARY

3. The Secretary shall keep the minutes of the proceedings of the Commission, and have charge of and be responsible for the safe-keeping of the books, records, papers, and other property in its office. He shall make the proper certification of those eligible for the Departmental Service. He

shall generally conduct the correspondence of the Commission and perform such other appropriate duties as it may assign to him.

BOARDS OF EXAMINERS

4. The general Board of Examiners for the Departmental Service shall consist of two persons from the Treasury Department, two from the Post-Office Department, two from the Interior Department, and one from each of the other Departments. But any three members may be designated by the Commission to constitute the acting Examining Board for any examination.

The secretary of the Board of Examiners for the Departmental Service shall keep a record of its proceedings and have charge of its papers.

5. In case of examinations to be held at other places than those having the classified service, the Commission will designate an Examining Board for that purpose.

6. For each post-office, the Board of Examiners shall consist of three persons.

7. The examiners for each customs district shall consist of two persons selected from the office of the collector, and one from each of the other customs offices which are subject to the rules; but if there be no office subject thereto except that of the collector, the three shall be selected from his office.

8. The examiners may serve as a Board for conducting any examination; and the Examiners for any customs district will determine which three shall hold any examination, taking care that, if an examination is wholly or mainly for any office, one or more of the examiners from that office shall be on the acting Board. In case of a failure or disagreement as to which three shall be the Board for any examination, the Commission or Chief Examiner shall designate the local examiners who shall serve. In case of the disability or necessary absence of one of the three examiners selected, the other two may conduct the examination.

9. Each Examining Board in the postal and customs service shall select one of its members to serve as secretary, and it shall be his duty to keep a complete record of the proceedings of the Board and of all examinations held. He shall also keep the Record of Applicants and Examinations, and the Register of Persons Eligible for Appointment. He shall have charge of all books and papers belonging to the Board and shall be responsible for their safe-keeping. On application of the proper appointing officer, he shall certify to such officer, in conformity to the rules, the names of the four persons of highest grade remaining on the register. He shall also answer all proper requests for application blanks, and send due notifications to applicants to be examined, and shall give all other notices required to be given by the Board.

10. No examiner or officer serving under the Commission must attempt to control or influence appointments, removals, or promotions.

11. Care must be taken by the examiners not to allow such visitors as they may admit, nor any conversation or other cause, to obstruct or distract those being examined.

12. Examiners must not disclose for public information, unless by consent, the names of those examined, nor more than the general results of examinations.

13. Complaints, which show injustice or unfairness on the part of any Examining Board, or any one acting under the Commission, will be considered by the Commission, and if necessary it will revise the marking and grading on the papers, or order a new examination, or otherwise do justice in the premises.

14. The head of each post-office and of each customs office, to which the rules are applicable, should inform the local Board of Examiners of probable vacancies, and examinations for filling them may be held in due season, and should also inform such local Board of the name of every person appointed or employed in the classified service under him (giving the date of the employment or appointment and the designation of the office or place) from those examined under said Board.

15. The Board of Examiners for each office or district must promptly notify the Commission of the need of holding an examination in and for such office or district, and may appoint the time for the same, but subject to any change the Commission may find it necessary to make for the more convenient and effective discharge of its duty to see that the examinations are accurate, uniform, and just. The notice must state under which clause or clauses of Rule 7 the applicants are to be examined, and must, when practicable, be given at least twenty days before the time appointed therein for the examinations.

EXAMINATIONS

16. Notices in writing should be mailed to applicants for examination in the postal and customs service at least eight days before the examination, except in cases of non-competitive and special examinations, and they shall clearly specify the place and the time, including the hour, of holding the same.

17. All competitive examinations for admission to the civil service shall be in writing, except that tests of physical qualities or expertness may be added as the Commission shall approve.

18. The examination sheets will be given out in the order of their numbers; each, after the first, being given only when the applicant shall return to the examiners the last sheet taken by him.

19. Not more than ten questions shall be given in any subject of the examination; and, to facilitate the marking, the questions in the same subject shall, as far as practicable, be equal in difficulty. Care shall also be taken that the time allotted for the examination shall be reasonably sufficient for answering the questions.

20. In general, no competitive examination should occupy more than five hours, and every Examiner will exercise all due diligence to secure fairness, and to prevent all collusion or fraud in the examinations.

21. The examination papers of each applicant shall be marked only with a number, and his name with his number shall be placed in a sealed envelope, which shall not be opened till after his papers are marked.

22. The examination papers shall, so far as practicable, be reviewed by each Examiner separately, and in any case of disagreement the average of the markings, to be made on the papers by all, shall be the final marking on each question, subject to the regulation as to revision.

23. The views of the heads of post-offices and customs officers, as to whether applicants for the several parts of the service under them shall be examined in the five subjects under clause 1 of Rule 7, or only in a less number of subjects under clause 4 of that rule, will be accepted by the Commission so far as its duty to require uniformity, and adequate tests of capacity for doing the public work, will permit.

MARKING AND GRADING

24. To whichever of the five subjects, or parts thereof, mentioned in Rule 7, a competitive examination may extend, the marking and grading of the applicant upon each is to be conducted in the same way.

25. To determine the Standing of the applicant in any subject, mark and credit each answer in proportion to its completeness and accuracy according to regulations prescribed for each subject; the perfect answer being credited 100. Divide the sum of the credits by the number of questions upon the subject: the quotient will be the applicant's Standing in that subject.

26. To determine whether any applicant has reached an Average Standing of 65 per centum in the first two or the first three subjects, add the figures marking the applicant's Standing in each; divide their sum by the number of the subjects and the quotient will be the Average Standing therein.

27. No applicant is entitled to go upon the Register of those eligible for appointment whose Average Standing upon the first three subjects, or such parts thereof as are covered by the examination, is below 65 per centum; therefore, when the marking and grading have been carried so far as to show such Average Standing to be below 65 per centum, they need not be carried further; and if the examination includes no part of the 4th or 5th subject, such Average Standing will be the General Average to be entered on the Register.

28. To whatever number of subjects the examination may extend, the General Average will be ascertained by dividing the sum of the marking showing the Standings in each of the subjects by the number of subjects.

29. Every example, though it be a case of dictation or copying, is regarded as a question under these regulations, and, although only a portion of the topics included in a subject under Rule 7 is embraced in the examination, it will, for the purpose of the marking, be treated as a subject.

The following example illustrates these directions:

[Sum of credits in each subject divided by number of questions gives credit in that subject.]

First subject.	Credit to each question.	Second subject.	Credit to each question.	Third subject.	Credit to each question.	Fourth subject.	Credit to each question.	Fifth subject.	Credit to each question.
Question 1	80	Question 1	40	Question 1	70	Question 1	60	Question 1	60
Question 2	45	Question 2	90	Question 2	45	Question 2	50	Question 2	90
Question 3	71	Question 3	74	Question 3	90	Question 3	35	Question 3	80
Question 4	50	Question 4	56	Question 4	85	Question 4	90	.....	..
Question 5	65	.....	..	Question 5	100	Question 5	100	.....	..
	311		260		390		335		230
Divide credits by number of questions	5		4		5		5		3
	62.2		65		78		67		76.66

The grade at which the applicant will go upon the Register, is, therefore—

$$62.2 + 65 + 78 + 67 + 76.66 = 348.86 - \frac{348.86}{5} = 69.77.$$

NON-COMPETITIVE EXAMINATIONS UNDER RULE 20

In case the necessity shall exist at any office or Department for holding a non-competitive examination under Rule 20, the following conditions shall be observed:

30. The Commission shall be immediately notified of such necessity and of the grounds thereof, showing that it is impracticable to supply, in due season, for any appointment the names of persons who have passed a competitive examination by reason of the failure of competent persons to attend to be examined, or the prevalence of contagious disease, or other sufficient cause.

31. If the Commission shall not disapprove the holding of a non-competitive examination, the Secretary of the Commission in Washington, or of the Examining Board for any post-office or customs district, shall notify for such examinations any persons whose names may be on the record as applicants for places analogous to those to be filled, and whom the exigency of time may allow to be notified, not less in number than the vacancies and places to be provided for, nor more than four for each of them.

32. If the number of applicants on the record be insufficient to furnish such supply, then the Examining Board, or in its absence the Secretary, may notify other suitable persons, nominated by said Board or Secretary, upon consultation with the head of the office, who, taken together with said regular applicants notified, shall, if practicable, be not less in number than four to each place to be filled. The persons selected for appointment or employment shall be required to make oath to the proper application paper before entering upon their official duties.

33. The non-competitive examination shall conform as nearly as practicable, in subjects, questions, and marking, to the competitive examinations of the same grade; but no person shall be appointed under such non-competitive examination whose average standing upon the first three subjects, clause 1, Rule 7, or such parts thereof as may be used, is less than 65 per centum; *Provided*, There are those who pass at or above that grade from whom the place can be filled.

34. The names of all the persons passing the examination shall be certified to the proper officer, and the existing vacancies shall be filled therefrom; but no person, by reason of such non-competitive examination, shall be appointed at any other time than during such exigency or to any other vacancy or place.

35. A record shall be kept by the local Examining Board, and by the Secretary of the Commission at Washington, of the persons thus notified, examined, and appointed, or employed, and copies of notices and the examination papers shall be preserved; and said Board shall, after

each such examination and appointment, make full report to the Civil Service Commission of all the facts.

36. In case a majority of the Commission may not be present when an examination hereunder may need to be held at Washington, the same may be conducted under the charge of the chief examiner and any two members of the Board of Examiners.

SPECIAL EXAMINATIONS

37. Special Boards of Examiners will, when deemed necessary, be designated by the Commission for the examinations in special and technical subjects under clause 5, Rule 7, and one or more members of each such Board will be selected from the office or bureau for which the Board is to serve. These special Boards shall be subject to the regulations prescribed by the Commission for the general Examining Boards as far as they are applicable, except as herein otherwise provided.

38. Applications for any special examination must be made in the form prescribed by the Commission, and must be accompanied by certificates as required in the case of ordinary applications. The minimum limitations of age shall be the same as those prescribed by Rule 12 for the several branches of the service, but no maximum limitations shall be required except such as the Commission may from time to time prescribe.

39. Whenever a special examination is to be held, notice in writing, specifying the time and place of the examination, shall be sent to a suitable number of the applicants in the order of their application for the same, in time to allow their attendance.

40. Each special examination shall embrace the subjects approved by the Commission therefor, after consultation with the head of the office concerned or the special Examining Board for such office; and shall, as far as appropriate, be conducted under the same general regulations, as to the marking of the examination papers and the grading of the persons examined, as those for ordinary examinations.

41. A special record of applicants and a special register of eligibles shall be kept for each part of the service or office requiring special examinations; and when the Commission, or the proper Examining Board, shall be notified by the appointing officer of a vacancy in such part of the service, certification shall be made to him of the names of the four persons graded highest on the special list of eligibles for the same, or of a less number, if four names do not remain thereon.

42. In case that competent special applicants do not apply, or do not appear for a competitive examination, after a suitable notice, a non-competitive examination may be held in as near conformity as may be to the regulations provided for non-competitive examinations for admission to the service. For such examination, applicants on the general Record, and persons on the general Register of Eligibles whose application papers claim the special knowledge required, may be notified, and if they appear shall be examined, as if special applicants; but no person so examined shall forfeit his right to the general examinations, or lose his place on any register of eligibles by reason of his special examination.

Information required in addition to the foregoing may be obtained upon written application to the Civil Service Commission, Washington, D. C.

Positions in the Philippine Civil Service, for applicants between the ages of eighteen and forty, may be secured through application to the Civil Service Commission, Washington, D. C.

INSTRUCTIONS FOR WOMEN DESIROUS OF ENTERING THE CIVIL SERVICE

THE APPLICATION FOR EXAMINATION

To every person requesting to enter the classified service, a blank application paper is sent. The filing of this paper is the first step in the applicant's examination. In the proper blanks she gives her name, age, residence, and occupation, for each of the past five years, and such other facts in regard to herself and her experience, education, and qualifications as are important to be known. All these statements are made under oath, and are required to be confirmed by the vouchers of not less than three or more than five persons, who state, in blank certificates on the same sheet, their knowledge of the applicant, and their belief in the truth of her statements, and vouch for her character, capacity, and good reputation. No recommendations outside of these vouchers are allowed to be received or considered by the Commission, the examiners, or the appointing officers.

The application thus filed is returned to the Commission, or to the proper Examining Board, and if its statements show that the applicant is regularly vouched for, and that she is entitled by age, health, and citizenship to be examined for the service she seeks, her name is entered upon the proper record, with the date of her application, and her paper is placed on file. When the examination is held, at a point which is deemed convenient for her, she is notified to be present. If the applications on file, at any office, are in excess of the number that can be examined at one time, the earlier applicants, by Rule 13, are summoned first; except that at Washington the duty of apportionment may require those to be first examined who are from States whose qualified applications are in deficient numbers. This excludes all preference of applicants through favor or patronage, and is the spirit of the act, section 5, which makes all wilful and corrupt obstruction of the right of examination a criminal offence. The applicants who are in excess of the number that can be examined at one time stand first upon the record to be notified for the next examination. Examinations are held as frequently as the needs of the service require. Thus far all applicants (except some from the District of Columbia, where the number is excessive, and in one or two similar cases outside) have been notified to attend the first examinations held after their applications were received.

The application paper is itself a sort of preliminary examination; it asks the same questions that any wise and experienced business man or appointing officer would desire to ask concerning the circumstances, health, character, and experi-

ence of the applicant, and it frequently deters from the examinations unworthy or incompetent persons, who find themselves unable to answer satisfactorily the inquiries proposed, or unwilling to give the information asked for. Of the best of place-seekers, many may be weeded out by the necessity of making this sworn statement of their career, while to genuine and worthy applicants it opens the way for the proper statement of their qualifications.

WHO MAY COMPETE

A competition theoretically perfect would be one in which every person, from any part of the country, could compete for every vacancy. But the needs of the public business, as well as the provisions of the act that the examination shall be practical, and shall fairly test capacity and fitness needed for discharging the duties of the place sought, require limitations. The qualifications needed for carriers or for weighers, for example, are quite different from those needed for copyists, or for some grades of clerks. Questions appropriate for ordinary clerkships would be unfit tests for telegraphers or pension-office examiners. Provision is therefore made under which the application paper designates the grade or description of places sought; and it follows that the real competition is between all those who seek the same grade or places.

Further than this, the act, requiring the appointments to the service at Washington to be apportioned among the States, Territories, and the District of Columbia, practically makes the competition between those from the same State or Territory rather than an inter-State competition. In some cases, perhaps, this State competition may put into the service a person inferior to the one whom the broader competition would have supplied. But it gives to each State and Territory, what it has not yet had, a proportion of the appointments numerically due to the population, and it will unquestionably stimulate education in the States as well as increase the local interest in all matters affecting the administration of the Federal Government.

SUBJECTS FOR EXAMINATION

The branches embraced in the general examination for ordinary clerkships and other places of the same grade are given in Rule 7. In none of these branches do the questions go further than is covered by the ordinary instruction in the common schools of the country. If limited examination is provided under clause 4 of Rule 7, for copyists, messengers, carriers, night inspectors, and other employees of similar grades, including only a part of the branches above named, the subjects and questions being varied in number and grade to meet the requirements of the different parts of the service, this allows persons of only limited attainments to secure the positions for which they are competent. The common-school education must have been exceedingly defective which does not enable one to pass this examination.

It will be noticed that, even in the general or higher grade of examination under clause 1, Rule 1, proficiency in the first three subjects secures eligibility for appointment. Therefore failure in the last two will exclude no one from the service, though a good standing therein raises the grade of the applicant and gives her the better chance for an appointment.

If any shall notice, with regret, that only common-school education is exacted for entering the public service at the higher grade, and that thus only small direct reward is offered to academic and college learning, it may be remembered, on the other hand, that both by rewarding excellence in the common schools and by barring out corrupt influence from public office, learning of every grade, and good character and effort in every position are stimulated and strengthened. The common schools are the gates to the academies, and the academies are the gates to the colleges.

SPECIAL AND TECHNICAL EXAMINATIONS

While only the common-school education is required of the applicant for the ordinary clerkship and subordinate places in the classified service, there are other places, comparatively few in number, for which higher qualifications are requisite. Among these are clerkships in the State Department, which demand some knowledge of modern languages, and of other special subjects; assistant examiners, draughtsmen, and other places requiring technical knowledge or skill, in the Patent Office; pension examiners and other clerkships in several Departments requiring some knowledge of law; draughtsmen and other employees in the Supervising, Architect's Office, and Engineer Department, and employees in other technical or scientific bureaus or divisions of the service. Rule 7, clause 5, provides for the special examinations for such places. Special Boards of Examiners have already been designated in the State Department, the Patent Office, and the Pension Bureau. Special examinations have been held of a telegrapher for the Department of Justice, and a telegraphic draughtsman for the Engineer Department.

QUESTIONS AND EXAMINATIONS

In order to secure uniformity and justice, the questions for the examinations are almost invariably prepared by the Commission; those for any Examining Board outside Washington being forwarded for its use just before any examination is to be held. They are printed upon sheets with adequate space below each question for writing or solution. The applicant gets her first knowledge of the question as the sheets are given her, one after the other as her work advances, at her examination table. The examinations are open to such spectators as can be accommodated without interfering with the quiet due to those being examined, but the answers are not exhibited without the consent of the person who wrote them. The question sheets, with answers thereon, are preserved as a part of the permanent records of the Commission, so that the fairness of the marking and grading can be tested as well a year as a week after they are made. It is hardly necessary to add that, except in the very few examinations needed for places requiring technical or scientific knowledge, no very difficult questions have been used. The examples in arithmetic do not go beyond the needs of the public business. Every question in geography, history, or Government is confined to that of the United States. Not a word of a foreign language, nor a technical term of art or science, nor any example in algebra, geometry, or trigonometry, has been employed in any one of the general or limited examinations; and these examinations alone are used for at least ninety-five out of every hundred places within the classified service.

CERTIFYING FOR APPOINTMENT

Those who have attained a grade showing fitness for appointment at Washington are placed

upon the proper register kept by the Commission for the service there; and at other places by the Examining Board at each place. (See Rules 13, 14, and 16, and Regulations 4 to 10.) These registers are permanent books of record, showing the age, grade, residence, date of entry thereon as eligible for appointment for all parts and grades of the service. When a vacancy occurs at Washington, the Commission, and when at a post-office or customs office the Examining Board of the same, certifies from the proper register four persons who are graded highest among those entered thereon for the grade or part of the service in which the vacancy exists. In the latter offices, where no appointment is required, the four graded highest must in every case be certified. At Washington, the Commission takes the four names from the list of those from one or more States (having names upon the register) which have the strongest claim on the basis of the appointment. But the highest in the grade, from the State or States which have such claim, must be taken; and the whole action in that regard appears on record. The grade is won by the applicant herself. The order of selection is fixed by the law and the rules. This excludes both favor and patronage.

WOMEN IN THE SERVICE

Nowhere, on the part of the Commission or its subordinates, is there any favor or disadvantage allowed by reason of sex. Only under free, open, competitive examinations have the worthiest women the opportunities, and the Government the protection, which arise from allowing character and capacity to win the precedence and the places their due. The need for political influence, or for importunate solicitations, especially disagreeable to women, for securing appointments in the classified service, exists no longer. Rule 16, clause 3, controls the certification of women for appointment so completely that the Commission has no discretion on the subject. The law in force before the passage of the Civil Service Act gave the heads of Departments authority to decide when women are required or can be accepted. Both the Civil Service Act and the Rules leave that authority unimpaired.

In order to prevent disappointment, we ought to add that, perhaps because the examinations naturally appeal to the hopes and the ambition of women, a greater number of them, in proportion to the places treated by the Departments as open to their sex, has been examined, and hence the number of women waiting to be certified is large in a like ratio.

REMOVALS

The power of removal and its exercise, for just reasons, are essential both to discipline and the efficiency of the public service. A life tenure would be indefensible.

The Civil Service Act and Rules leave the authority and duty of removal undisturbed, with this exception, that the second rule forbids a removal for refusing to perform a political service, or to pay a political assessment; and the last rule adds every violation of either a rule, or the provisions of the act against assessments to the good causes for removal which existed before. The act and rules have greatly diminished the pressure upon appointing officers for removals, and have taken from them the temptation to make removals of their own motion for the mere purpose of making a vacancy for a favorite. Many removals, and those the most indefensible in former years, were unquestionably made not because the person removed was not a useful public servant, but because some powerful influence was to be conciliated, some friend was to be gratified, or some dangerous enemy was to be placated by putting a particular person in the vacancy.

Nevertheless, save in the particulars mentioned, the power to remove for even most partisan and selfish reasons remains unchanged. The changes are only in the opportunity of filling the vacancy with favorites and henchmen, and in the greater peril from a frowning, hostile public opinion.

PROMOTIONS AND OTHER EXCEPTIONS FROM THE RULES

Rule 19, recognizing needs in the public service familiar to those acquainted with the conditions of good administration, allows the applicant for certain places to be appointed without examination. The confidential or fiduciary relations sustained by those who fill some of these places, the occasional need of employing persons of professional standing or of peculiar capacity in others, and the lack of temptation for disregarding the public interests in filling others, are the reasons for all but one of these exceptions.

The entire exceptions (outside those relating to promotions), cover but few places—not exceeding 135 in all the Departments at Washington; and in the postal and customs service the ratio of excepted places is smaller still.

PROBATION

The rules provide for a probationary service of six months before any absolute appointment can be made. At the end of this time the appointee goes out of the service, unless then reappointed. During the probation, the character of the service rendered by the probationer, and her fidelity, are carefully observed, as the question of a permanent appointment depends upon them.

The probation is a practical scrutiny continued through six months in the very work which the applicant is to do. This part of the system meets oft-repeated objections based on the assumption that no merely literary examination can show all the qualities required in a good officer. Nobody pretends that an examination in any branch of learning is an adequate test of business capacity. Congress clearly recognized its inadequacy, and therefore provided that in all cases there shall be a period of probation before any absolute appointment or employment. Instead of this practical test being foreign to the competitive system, it is original with that system, and is everywhere an important part of it.

It has been shown, moreover, upon each of the several trials of competitive examinations, that in a large majority of instances the superior men in the competitions are also the superior men in the public work. The proportion, among the bright minds, of thos who have good business capacity, is at least as great as the proportion of those having that capacity among men of very dull minds. Between these extremes, they who excel in the schools do so by reason of the fidelity, patient labor, and good habits—qualities which also fit them for the public service.

The first person to enter the public service anywhere under the present rules—a young man at the Post-Office at St. Louis—was the first in the competition, and he was the first to be promoted for merit at the end of his probation. The first person appointed under the rules to a department at Washington was a lady who stood first on the competitive list of her sex.

COMMERCE AND MONEY

COMMERCE of all grades, from the limited trade of a country store to the traffic between nations, demands some definite and recognized medium of exchange. After human society had emerged from its most primitive form, it rapidly outgrew the possibility of conducting business by simple exchange of commodities. Consequently, money in its most rudimentary shapes appeared in history, and the development has continued to the present day, as will be learned in these pages.

EARLY INSTRUMENTS OF EXCHANGE AND BARTER

SKINS of wild animals cured constitute one of the earliest forms of currency known, and while employed in the most ancient times, are not yet disused in some portions of the world. Such a medium seems appropriate among those who subsist by the chase, as all primeval peoples must in some degree, and it is not, therefore, surprising to find that in the transactions of the Hudson Bay Fur Company with the Indians the unit of value by which the price of other articles was reckoned was the beaver skin.

Pastoral people employ similarly the skins of tame animals, originally delivering the entire skin, a cumbrous process deficient in convenience and economy, but finally employing a small disk cut from the leather as a representative of its value. Live stock is also widely employed, as it has been from the days of Abraham, and though a rude, it is still a substantially uniform denominator of value. The Greeks stamped the image of an ox on a piece of leather, and the image had thence the current value of the animal represented. In the East, the camel, the ass, and the sheep have been, ever since they were subdued to the uses of mankind, employed to reckon possessions or determine the amount of tribute or marriage portions. In Lapland and some portions of Sweden and Norway the amount of wealth possessed by a person is denominated in reindeer. Among the Tartars the number of mares similarly determines the opulence of their possessors. Among the Esquimaux it is customary to speak of one another as worth so many dogs.

Slaves have been employed to determine ratios of value since the state of bondage was first established among men. In New Guinea the slave is still the unit by which the value of other possessions is recorded, as he used to be among the Portuguese traders of the Gold Coast. The Portuguese also found small mats called libongoes, valued at about 1½ pence each, employed as currency on the African coast, and bunches of red feathers serve by their comparative stability to mark the fluctuations of yams and breech-clouts in some of the tropical islands of the Pacific. Some tribes of North American Indians found wampum as useful in their rather limited mercantile transactions as the merchant of South Street or Burling Slip finds greenbacks or bills of exchange.

Cowry shells are still extensively used in East India, Siam, and among some of the islands of the Indian Archipelago. Among the Fijians whales' teeth pass readily from hand to hand, effecting all necessary inter-

changes, the red teeth being taken at about twenty times the value of the white ones.

Ornaments of all kinds have in all times constituted measures of value. In Egypt, Phœnicia, Etruria, and many other ancient countries, as well as in Ireland and Northumbria, rings have been found which were designed to serve the double purpose of ornament and currency, and the same dual function may be ascribed to the anklets, armlets, and ear-rings which are worn throughout British India, Persia, Egypt, and Abyssinia. The Goths and Celts fashioned their rings of thick golden wire wound in spirals, from which various lengths could be broken to accommodate the varying needs of traffic. Gold chains have been similarly employed. In many countries golden beads are yet hoarded, worn, and circulated, fulfilling thus the triple functions of money, inasmuch as they constitute at once a store of value, a standard of value, and an instrument of exchange. Amber was used as currency by the savage races of the Baltic in the period of the Romar dominion, as it still is in some of the regions of the East. The Egyptian scarabee, carved on sard or nephrite or other precious stones, circulated freely throughout the Mediterranean coasts and islands probably before the first Phœnician coin was impressed; and engraved gems and precious stones were employed to transfer wealth as well from one country to another as from hand to hand until a comparatively recent period. In Africa ivory tusks pass to and fro in the process of trade, rudely defining the ratio of value of other articles. Among the Tartars, bricks of tea, or cubes of that herb pressed into a solid form, pass from hand to hand as freely as beaver skins do at the trading posts of Hudson Bay or the Saskatchewan. Among the Malayans the only currency entirely equal to the requirements of trade consists of rough hardware, such as hoes, shovels, and the like. Pieces of cotton cloth of a fixed length, called Guinea cloth, for a long period constituted the unit of value in Senegal, Abyssinia, Mexico, Peru, Siberia, and some of the islands of the Pacific Ocean. In Sumatra, cubes of beeswax of a fixed weight; in Scotland, hand-made nails; in Switzerland, eggs; in Newfoundland, dried codfish; in Virginia, tobacco; in Yucatan, cacao-nuts; in the Greek Islands and the Levant, olive-oil; in the regions of the Upper Nile, salt, have all, at one time or another, served the purposes of commercial interchange. In agricultural countries it is not strange that corn should have early been adopted as a measure of value. The leases of the great school foundations of Britain, Cambridge, Oxford, and Eton, with probably many others, were "corn leases," that is, specifying that the rental should consist of so many quarters of corn. In Norway, corn is deposited in banks and loaned and borrowed on time or call loans, as money is with us. In Central America and Mexico, maize was long employed to serve the uses of currency.

METALLIC MONEY

In New England, in the early colonial days, leaden bullets were employed to indicate value, and that metal is still coined and circulated in Burmah. Pewter has often been coined, and in many countries, though not to the same extent as tin. In fact tin coins are not only of immense antiquity, but their impress has been sanctioned by government authority down to a recent period. The Phœnician mariners freighted their galleys with the tin of Britain before Carthage was founded, and coins of the same oiled the wheels of commerce in the marts of Tyre and Sidon before Solomon built the temple at Jerusalem. In England, as late as the period of William and Mary, tin halfpence and farthings were struck, though they failed to become a permanent part of the circulation. In numismatical collections, series of tin coins stamped with the effigy and legend of several of the Roman emperors, are abundant. In Java as well as Mexico, tin coins were once current, and the metal, measured by weight, is still a sort of legal tender in the Straits of Malacca.

In all civilized countries, gold, silver, and copper have always constituted the main elements of coinage and the most familiar forms of currency. The ratio of value between the first two has probably varied less during the last 2,500 years than that between any other known substances. Copper has fluctuated more, but its function has always been subsidiary and limited to small transactions. In the hierarchy of the metals used as coins, gold may represent the king, silver the lord, and copper the slave. The latter is now practically emancipated, bronze and nickel taking its place. Indium, osmium, and palladium have been proposed as substitutes for gold, and aluminium and manganese for silver, but without any practical result thus far. Platinum, which is mainly found in the Ural Mountains, has been coined to some extent by the Russian

Government; but, although a beautiful and valuable metal, possessing many of the qualities to render it acceptable as coin, its employment as money has been found to be impracticable.

Great numbers of alloys have been employed in coinage, and indeed it may be said that almost the entire system of metallic currency throughout the world is composed of alloys. The Tuscan sequin, the purest coin known in history, contained 999 parts of gold in 1,000. The six-ducat piece of Naples was next in purity, having only an alloy of 4, while old Byzantine coins called bezants contained an alloy of 14 parts in 1000. Pure gold and silver, however, are soft metals, and, untempered by others, are subject to serious loss by abrasion. They are, therefore, rendered more useful by the admixture of a small portion of copper, which, in the English system, in the case of gold, may be expressed decimally by 916.66, and of silver 925 parts in 1,000. Nickel is usually alloyed with three parts of copper, and it is noteworthy that its adoption as a subsidiary coinage in Germany, coincident with the demonetization of silver, caused it to advance rapidly in price, while the latter was as rapidly declining. The old Roman *as* was made of the mixed metal called *æs*, a compound of copper and tin, and in quality and value not unlike bronze. Brass was also extensively used from the time of Hiram of Tyre to that of the Emperor Otho. The old Kings of Northumbria coined a small money called stycas out of a natural alloy, composed of copper, zinc, gold, silver, lead, and tin, which the metallurgists of that rude northern coast had not enough chemical skill to separate.

Lycurgus established an iron coinage for Lacedæmon, not only making the coins of such weight and bulk as to forbid their export, but depriving them of their metallic value by causing them while heated to be plunged into vinegar, thereby destroying their malleability.

While these coins were the largest of which historic mention is made, the Portuguese rei, too small to be actually coined, is doubtless the smallest unit of value in the money systems of the world. It is only about the nineteenth part of an English penny, and is considerably smaller than the Chinese cash, which, of actual coins, is perhaps of the lowest value known. In Sweden, during the eighteenth century, huge squares of copper weighing between three and four pounds, with a stamp in each corner and one in the centre, were issued as coin, and curious specimens of them may still be seen in numismatical collections. These, with the Maundy money, a small portion of which is still annually struck at the British Mint and distributed by his Majesty in alms probably represent the extremest variation of dimensions known among modern systems of coinage, the smallest piece of the Maundy money being a silver penny.

The Chinese probably illustrate in the most extreme manner the length to which loose views concerning currency can be carried. The history of their currency presents that mingling of the grotesque with the tragic which most of their actions have when viewed through Western eyes. Coined money was known among them as early as the eleventh century before Christ, but their inability to comprehend the principles upon which a currency should be based has led them into all sorts of extravagances, which have been attended by disorder, famine, and bloodshed. Coins came at last to be made so thin that one thousand of them piled together were only three inches high; then gold and silver were abandoned; and copper, tin, shells, skins, stones, and paper were given a fixed value and used until, by abuse, all the advantages to be derived from the use of money were lost, and there was nothing left for the people to do but to go back to barter, and this they did more than once. They can not be said now to have a coinage; 2,900 years ago they made round coins with a square hole in the middle, and they have made no advance beyond that since. The well-known *cash* is a cast-brass coin of that description, and although it is valued at about one mill and a half of United States money, and has to be strung in lots of one thousand to be computed with any ease, it is the sole measure of value and legal tender of the country. Spanish, Mexican, English, and United States money are employed in China; they pass because they are necessary for larger operations, and because faith in their standard value has become established; but these coins are accepted and used simply as stamped ingots, with their weight and fineness indicated.

COINED MONEY OF GREAT BRITAIN

In Great Britain money of the current and standard coinage is frequently signified by the term *sterling*, as "one pound sterling," etc. With respect to the origin of

the word sterling, there are three opinions. The first is that it is derived from Sterling Castle, and that Edward I., having penetrated so far into Scotland, caused a coin to be struck there, which he called Sterling. The second opinion derives it from the figure of a bird called starling, which appears about the cross in the ancient arms of England. The third most probably assigns its true origin, by deducing it from Esterling; for in the time of Henry III it is called *Moneta Esterlingorum*, the money of the Esterlings or people of the East, who came hither to refine the silver of which it was made, and hence it was valued more than any other coin, on account of the purity of its substance. The denomination of the weights and their parts is of the Saxon or Esterling tongue, as pound, shilling, penny, and farthing, which are so called in their language to the present day. The term sterling is now disused in England in all ordinary transactions, but is still used in Scotland to distinguish sums from the ancient money of the country, as referred to in old deeds and notices of pecuniary transactions. The old Scots' money, previous to the Union of 1707, was in pounds, shillings, and pence, but these were only a twelfth of the value of sterling money of the same denomination; thus a pound Scots was only twenty pence sterling. The word sterling is also in use in the colonies, to distinguish the legal standard of Great Britain from the currency money in these places.

It is customary to estimate the purity of gold by an imaginary standard of 24 carats. If in a piece of gold weighing 24 carats there be 1-24 of alloy, then the piece is one below the standard. What is called jewelers' gold is seldom purer than 20 fine to 4 of alloy—the alloy being usually silver, but sometimes copper, which gives a deeper red tinge to the metal. Perfectly pure gold is never seen either in trinkets or coins, for it is too ductile, and for that and other reasons requires a certain quantity of alloy. Sovereigns, and other modern English gold coins, contain one-twelfth of alloy, but this twelfth is not reckoned as gold in point of value. At present the gold coin of Great Britain is issued at very nearly its precise market value as bullion. A pound weight of gold of 22 carats fineness produces coins to the amount of £46 14s. 6d., which is about the price at which bullion sells for in the market. Thus the gold of that country is coined free of expense. In coining silver, the government was allowed, by the Act of 56 Geo. III, a profit or seigniorage of about six per cent; the pound weight of silver, which should produce 62 shillings, being coined into 66 shillings. The silver coins being therefore of a little less real value than the sums they represent, they are not liable to be melted down by silversmiths for the manufacture of articles in their trade.

The word *money* is from the Temple of Juno *Moneta*, in which money was coined by the Romans. *Pecuniary* is from *pecus*, a flock—flocks and herds of animals being originally equivalent to money, or things constituting wealth. *Cash*, in commerce, signifies ready money, or actual coin paid on the instant, and is from the French word *caisse*, a coffer or chest in which money is kept. *Pound* never was a coin; the term was originally employed to signify a pound weight of silver, but afterward it was employed to mean twenty shillings in tale, or by counting. *Guinea* took its name from the coast of Guinea in Africa, whence the gold for it was originally brought; at first, the piece was current at twenty shillings, afterward it was equal to 21s. 6d., and finally settled at 21s. In the present day the guinea is not coined, and the term only remains to indicate 21s. Honorary fees and gifts are still usually reckoned in guineas, though paid in other money. *Shilling* and *penny* are both from Saxon words; the penny was first coined in silver. *Groat* was a name given to silver pieces equal to four pennies in value, coined by Edward III; the word groat is a corruption of *grosses* or great pieces, and was given to distinguish this larger coinage from pennies or small coins. *Farthing* is a corruption of *fourthing*, or the fourth part of a penny.

COINED MONEY OF THE UNITED STATES

What is termed money in the United States now consists of gold, silver, nickel, and composition coins, and the paper currency, in bills, issued by the banks under a national banking law.

In compliance with the first section of the Act of March 3, 1873, the director of the mint made an estimate of the value in United States money of the standard coins of foreign countries, and by order of the Secretary of the Treasury, October 1, 1900, the following are now to be taken in estimating the values of all foreign merchandise made out in any of said currencies, imported since the latter date:

COUNTRY	MONETARY UNIT	STANDARD	VAL. IN U. S. MONEY	STANDARD COIN
Argentine Republic.	Peso	Gold.	$ .96.5	Argentine, 1-2 A., Peso and divisions.
Austria	Crown	Gold.	.20.3	20 crowns and 10 crowns.
Belgium	Franc	Gold.	.19.3	Gold, 10 and 20 francs; silver, 5 francs.
Bolivia	Boliviano	Silver.	.45.1	Boliviano and divisions.
Brazil	Milreis, 1,000 reis	Gold.	.54.6	Gold, 5 to 20 milreis; silver, 1-2 to 2 milreis.
British Pos. in N. A.	Dollar	Gold.	1.00	
Central America	Peso	Silver.	.45.1	Peso and divisions.
Chili	Peso	Gold.	.36.5	Condor, doubloon, and escudo.
Denmark	Crown	Gold.	.26.8	10 and 20 crowns.
Ecuador	Sucre	Silver.	.45.1	Gold: Condor ($9.64.7), Sucre and divisions.
Egypt	Pound, 100 Piasters	Gold.	4.94.3	5, 10, 25, and 50 piasters; silver, 1 to 20 piasters.
France	Franc	Gold.	.19.3	5, 10, 20, 50, 100 frs.; silver coins.
Great Britain	Pound Sterling	Gold.	4.86.6	1-2 sovereign and sovereign.
Greece	Drachma	Gold.	.19.3	5, 10, 20, 50, and 100 drachmas.
German Empire	Mark	Gold.	.23.8	5, 10, and 20 marks.
India	Rupee, 15 to Sov.	Silver.	.32.4	Sovereign, rupee, and divisions.
Italy	Lira	Gold.	.19.3	5, 10, 20, 50, and 100 lire.
Japan	Yen (gold)	Gold.	.49.8	1, 2, 5, 10, and 20 yen; silver, 10, 20, 50 sen.
Liberia	Dollar	Gold.	1.00	
Mexico	Dollar	Silver.	.49	Peso or dollar, 5, 10, 25, and 50 centavos.
Netherlands	Florin	Gold.	.40.2	Gold: 10 florins; silver: 1-2 to 2 1-2 florins.
Norway	Crown	Gold.	.26.8	10 to 20 crowns.
Peru	Sol	Gold.	.48.7	Gold: libra ($4.86 1-2); silver: sol.
Portugal	Milreis, 1,000 reis	Gold.	1.08	1, 2, 5, and 10 milreis.
Russia	Ruble, 100 copecks	Gold.	.51.5	Gold: Imperial ($7.71.8); silver: 1-4, 1-2, 1 ruble.
Spain	Peseta, 100 centimes	Gold.	.19.3	Gold: 25 pesetas; silver: 5 pesetas (peso).
Sweden	Crown	Gold.	.26.8	10 and 20 crowns.
Switzerland	Franc	Gold.	.19.3	5, 10, 20, 50, and 100 francs.
Turkey	Piaster	Gold.	.04.4	25, 50, 100, 250, and 500 piasters.
U. S. of Colombia	Peso	Gold.	.45.1	Gold: condor, ($9.64.7); silver: peso.

The gold pieces are:

1. The double eagle, or $20 piece. Coinage of the double eagle was authorized by the Act of March 3, 1849. Its weight is 516 grains. Its fineness is 900. (This technical form of expression means that 900 parts in 1,000 are pure metal, the other 100 parts are alloy.)

2. The eagle or $10 piece. Its coinage was authorized by the Act of April 2, 1792. The weight was first established by law at 270 grains, but was changed forty-two years afterward, by the Act of June 28, 1834, to 258 grains, where it has remained ever since. Its fineness was in the beginning made 916 2-3, but was changed by the Act of June 28, 1834, the same Act that lowered its weight, to 899.225. Two years and a half subsequently its fineness was increased —less than one part in a thousand—to 900. Its weight and fineness have remained thus fixed to the present day.

3. The half eagle, or $5 piece. This elegant coin has undergone the same vicissitudes as the eagle. Its coinage was authorized by the same Act of April 2, 1792. Its weight was 135 grains and its fineness 916½. By the Act of June 28, 1834, its weight was reduced to 129 grains and its fineness to 899.225. By the Act of January 16, 1857, its fineness was slightly raised to the uniform standard of 900. Its weight and fineness have thus remained to our time.

4. The quarter eagle, or $2.50 piece. This fine coin belongs to the same family with the eagle and half eagle. Its coinage was authorized, its weight and fineness correspondingly altered by the same Acts. The statute of 1792 made its weight 67.5 grains and its fineness 916½. Its weight was reduced to 64.5 grains and its fineness to 800.225 by the Act of 1834. The Act of 1837 raised its fineness to 900.

5. The dollar. This pretty little gold piece was created by the Act of March 3, 1849, the same Act that authorized the coinage of the double eagle. It has remained unchanged. Its weight is 25.8 grains and its fineness 900.

6. Three-dollar piece. An Act of February 21, 1853, established this irregular coin. Its weight, 77.4 grains, and its fineness, 900, are of the normal standard, and have not been changed by subsequent Acts.

In gold coin the alloy was at first a compound of silver and copper. It was forbidden by statute that the alloy should be more than half silver. It is now nearly all copper, owing to advances in the art of assaying and improved methods in coinage.

There are four coining mints, located at Philadelphia, Pa; San Francisco, Cal.; Carson City, Nev.; and New Orleans, La., the last one being put in operation on January 20, 1879. The largest proportion of assaying and refining is done at New York City; Helena, Montana; Boise City, Idaho; and Denver, Colorado.

In the closing year of the nineteenth century (1900) there were 3,587 National Banks

in the United States. Their combined capital was $604,756,505, but this amount was augmented by a combined surplus of $253,475,898. On this total amount dividends of $24,228,936 were paid out of net earnings of $40,151,038. On this showing the ratio of dividends to established capital was about 4.01 per cent, but with the surplus capital counted in with the regular the proportion of dividends to the amount invested was but 2.82 per cent. Even when the earnings are considered, in connection with their ratio to the combined capital and surplus of the National Banks of the country, we find that these earnings represent only 4.68 per cent of the money that these National Banks carry in their own names.

The first silver coins were struck in 1794 (authorized in 1792), at the Philadelphia Mint, and consisted of 1,758 dollars and 10,600 half dollars, and a few half dimes (5 cents), more for curiosities than use. In the succeeding year the issue was 203,033 dollars, 323,038 half dollars, no quarters, no dimes, and 86,416 half dimes. In 1796 the mint coined only 72,920 dollars and 3,918 half dollars, with 2,948 quarters. In 1797 the number of dollars issued was 2,776, and the mint records state that there were no half dollars and only 252 quarters. Dollars only were coined in 1798. In 1796 the head of Liberty was changed, and a new head, inferior in point of comeliness, substituted. This also had flowing locks, but these were bound by a broad fillet, and hence the name "fillet dollars." In 1798 there were no halves or quarters, and there were none in 1799, nor again in 1800. But in the following year the half dollars were commenced again, being of the fillet series, with the heraldic eagle on the reverse.

In 1804, according to the records, 19,570 dollars were issued, 156,519 halves, and 6,738 quarters. There are but two dollars of 1804 known to exist, and these are said to have been struck surreptitiously from the original die at the Philadelphia mint in 1827. The value of these two to numismaticians is enormous; as high as $1,000 has been refused for one of them.

The first dollar pieces (1792) contained 416 grains of silver of 892.7 fineness, and this proportion was maintained until 1873, when the quantity of silver was reduced to 412.5 grains, and the fineness increased to 900. The fifty cent pieces, from 1792 to 1837, contained 208 grains, 892.7 fineness, and the twenty-five cent pieces a proportionate amount; and both were subjected to a reduction in number of grains and increase in fineness in 1873. The ten-cent pieces contained 41.6 grains, of standard fineness, and now bear 38.58 grains under the new standard of fineness. From 1851 to 1853, the five cent pieces were composed of 12,375 grains, 750 fine, and from 1853 to 1873, when their coinage was abolished, 11.52 grains, 900 fine. The old copper cents, authorized in 1792, contained 264 grains; the next year the amount was reduced to 208, and three years later to 168. As a purely copper token this coin was abolished shortly after the last reduction in the number of grains. The two cent piece of April, 1864, contained 96 grains of copper, zinc, and tin, and was discontinued in 1873. The half cent pieces were established in 1792, containing 132 grains; this amount was reduced in 1793 to 104, and in 1796 to 84. None are coined now. An Act of March, 1875, authorized the coinage of a silver twenty cent piece, containing 77.16 grains, 900 fine. This coin being but a trifle smaller than the twenty-five cent piece, led to such a general confusion of the two, that in 1878 its coinage was stopped. But few are now found in circulation. The one cent piece of present use was authorized in 1857, and consisted ot 72 grains of copper and nickel, and in 1864 this composition was changed to 48 grains of copper, zinc, and tin. Finally, the five and three cent nickel pieces were authorized in 1866 and 1865 respectively; the latter has a comparatively small circulation.

SAVINGS BANKS AND OTHER SCHEMES FOR POPULAR SAVINGS

The number of savings banks in the United States, in 1900, according to the report of the Comptroller of the Currency, was 1,002. These banks represented 6,107,083 depositors, or considerably less than one in every ten of our population. Their total deposits, however, reached the sum of $2,449,547,885. In Great Britain the number of depositors was larger, viz.: 9,493,838, yet the total savings of these depositors amounted to only $916,836,845. A computation of the deposits of all the patrons of savings banks in the world shows that their savings amount to the sum of about seven billions of dollars. France paid Germany an indemnity of about a billion dollars. All the savings bank depositors in the world could pay this indemnity but seven times. In the United States we pay little attention to the statement that an

individual is worth $100,000,000. Yet that means that he owns one-seventieth as much as all the depositors of the world have in bank.

Savings banks receive and take charge of small sums, the savings of industry, and were instituted for the benefit of workmen and others, who were able to spare a little from their earnings. It is believed that Quaker thrift in Philadelphia, Pa., led to the inception of the idea, and that the first savings bank in the world was founded in that city in 1816. As the scheme grew in popularity throughout the United States, guardians of minor children, administrators of estates of deceased persons, and other holders of trust funds, found the savings banks very serviceable as places of deposit for money that had to be laid away for a specified period of time. Hence, the exigencies of business transactions forced an innovation upon the original plan. In the United States this use of savings banks is still maintained; but during the past fifteen years Safe Deposit and Trust Companies have been numerously established for the special purpose of holding funds, both in trust and in legal dispute, besides securities of all kinds, jewelry, diamonds, and articles of like value. Thus a guardian, an administrator, or a society will invest money in Government, State, or City bonds, or, if permitted by the terms of the trust, in real estate or stock of various corporations, and place the bond, certificate of stock, or other acknowledgment of the indebtedness, with a safe deposit or trust company, for safe-keeping. The savings banks are allowed by law to invest their money in first-class securities only.

The average rate of interest allowed by savings banks in the United States on deposits is four per cent; it is frequently below that rate. Some of the larger banks will not permit individual deposits beyond a special amount at one time, while others decrease the rate of interest as the amount of deposits increases, claiming that their vast aggregates of deposits can not be invested, under the law, in a manner that will warrant the maximum rate of interest after paying current expenses.

From Philadelphia the original conception or plan of the savings bank extended all over the United States, throughout Great Britain, France, and other countries. Several Acts of Parliament were successively passed between 1817 and 1828 for the regulation of savings banks in England; and in the year last mentioned the whole of these were consolidated in one statute (9 Geo. IV, chap. 92). This Act, together with another passed in 1833, conferring additional and important privileges on savings banks (3 Will. IV, chap. 14), constitutes the existing law relative to these establishments. In 1835 the Act was extended to Scotland.

Several new features of taking care of small savings have been instituted that deserve mention in this connection. Let us glance first at the operations of the so-called creditors' loan societies of Germany, founded by Schulze-Delitzsch, and which practically discharge the function of banks for workingmen. In 1878 these numbered upward of 1,800, and the balances reported by 929 show aggregate advances for the year amounting to $375,000,000—a sum which, distributed among the laboring population, should have afforded material relief in a time of financial stringency.

Impressive testimony to the stability and usefulness of these workmen's banks is the success with which they withstood the then prostration of industry and commerce in the German Empire. Indeed, the system is so well accredited by experience that it has been introduced in other parts of Europe, and especially in Italy and Belgium, where co-operative credit banks have become numerous enough to form unions and hold congresses.

The second of these novel schemes is the system of Penny Banks, introduced into England in 1857, the first being opened at Greenock, where five thousand depositors availed themselves of its advantages in the first year. From year to year penny banks have been on the increase, and from recent statistics it has been shown that at the present time progress is in every way satisfactory.

Rapid as has been the progress of the penny-bank movement in England, it is far behind France and Belgium. In both those countries, school banks have been instituted with much greater success than has hitherto crowned the attempt made in England, and it is to the development of these school-banks that the marvelous increase in the total amount deposited in savings banks generally is to be attributed. In the United States school-banks have been organized, thus far, in but few places throughout the vast educational reaches of the country. An exhibit of such a system, with tables of statistics for the few schools in which this primary instruction in saving had been introduced, was made at the World's Co-

lumbian Exposition, but little has since been accomplished.

In Belgium an admirable plan is adopted. Prizes are given by the government to elementary scholars for general proficiency, in the shape of a deposit book, with a small sum entered therein to the credit of the recipient. In this way good conduct is rewarded, and in addition a practical lesson in thrift is imparted. From 1873-75, 1,051 deposit books were distributed in this way.

This leads to a consideration of a third scheme. The report of the Postmaster-General of England of July, 1877, gave the following particulars. During 1876, authority was given for one hundred and seventy-two penny banks in various parts of Great Britain to invest their funds in the Post-Office Savings Bank, and since that time the progress has been even more remarkable, one hundred and seventeen penny banks having been authorized during the quarter ending March 31, 1877, exceeding by forty-one the number during the corresponding quarter in 1876. Of these two hundred and eighty-nine penny banks, eighteen were in board schools, twenty in Sunday schools, and thirty in other schools, one being in a Poor-law Union-school, under the management of the master and chaplain of the workhouse. Farthing deposits were received from these pauper children, and as much as £4 18s. was invested on behalf of the penny bank between April and December, 1876.

Since then the attention of English philanthropists and students of social economy has been directed to the conservation of the penny.

Every post-office, being a money-order office, is open for the purpose of the savings bank, during the money-order office hours. Deposits may be made in amounts of $1 for any number of dollars (cents not being received), provided the deposits made in any one year ending June 30 do not exceed $300, and provided the total amount standing in such depositor's name on the books of the Postmaster-General does not exceed $1,000 exclusive of interest. This provision is made to prevent the system from clashing with the general banking business of the country. The privilege of purchasing Government bonds is allowed the depositor, so that if he desires to still use the Post-Office Savings Bank after he has accumulated $1,000, he can have that amount, or any portion of it not less than $100, transferred to bonds, redeemable on three months' notice.

COMMERCIAL TERMS AND TRANSACTIONS IN COMMON USE

The following explanations of the principal terms used in commerce will illustrate the mode of conducting business transactions.

Firm.—Every business, whether private or public, is conducted under a specified designation or title, called the name of the firm. This name may be that of a single individual to whom the business belongs, or of two or more individuals, or any title which it may be found advisable to adopt. Sometimes the name of a firm remains long after all indicated by it are dead; in such a case, the business has passed into the hands of new proprietors, who, though legally responsible for its obligations, are not, for some private reason, inclined to change the old and well-known title of their firm. A particular firm or business concern is sometimes personified in the term *house*—as, Such a house does a great deal of business, etc.

Company.—Two or more individuals engaged in one business constitute a company or copartnership, each individual being called a partner. Companies are of two kinds, private and public. A private company or partnership is organized without incorporation, each member having certain duties to perform and a certain share in the concern. In companies of the private and common description, no individual can leave the concern at his own pleasure, for by doing so he might seriously injure or embarrass his partners. He can withdraw only after giving a reasonable warning, by which time is allowed to wind up the concern, or place it in a condition to pay him back the capital which he has risked, or the profits which are his due. No partner, however, can transfer his shares to another person, by which a new member would be introduced into the firm without the consent of the partners.

The profits of partnerships are divided according to a specified agreement. Generally, in the case of partnerships of two or three persons, each receives the same share on the occasion of an annual division, but in other cases, a partner may not be entitled to more than a fourth or sixth part of what another receives. The amount of capital which a partner invests in the concern, the service he can be to the business, and other circumstances, regulate the amount of his share. When each of two persons sinks the same capital, but one takes the whole of the trouble, then he on whom the trouble

falls, who is called the active partner, is entitled to receive a stated sum in the form of salary over and above his share of profits. Whatever be the share which individual partners have in a concern, the whole are equally liable for the debts incurred by the company, because the public gives credit only on the faith that the company generally is responsible. He who draws the smallest fraction of profit, failing the others, may be compelled to pay all the debts.

Public companies are very different; they consist of three or more partners, or proprietors of shares, the aggregate amount of which forms a joint stock, and hence such associations are called *joint-stock companies*. They are public, from being constituted of all persons who choose to purchase shares, and these shares or rights of partnership are also publicly salable at any time without the consent of the company. The value of a share in a joint-stock company is always the price it will bring in the market; and this may be either greater or less, in any proportion, than the sum which its owner stands credited for in the stock of the company. Unless specially provided for in the fundamental deed of copartnery, every member of a joint-stock company is liable in his whole personal property or fortune for the debts of the concern.

It is an axiom in commerce, that business is much better conducted by single individuals, for their own behoof, than by companies of any kind; as respects joint-stock associations, they are only useful in very great concerns requiring enormous capital, and involving serious risk of loss.

Capital.—The capital of a business man is strictly the amount of money which he embarks in his trade, or trades upon, that is, employs for buying goods, paying wages of servants, and liquidating all debts when due. Within the limits of his capital, business is upon a secure footing; but if he proceeds beyond these in any material degree, he is said to be *over-trading*, and is exposed to the chance of ruin or very serious embarrassment. Trading beyond the amount of available capital is, nevertheless, a prevailing error, and causes innumerable bankruptcies. With a comparatively small capital, a tradesman may carry on a large business, by receiving payments shortly after making his outlays. By this means, there is a rapid turning over of money, and small profits upon the various transactions speedily mount up to a large revenue. For example, if a tradesman turn over his capital twelve times in the year, at each time receiving money for what he sells, he can afford to do business on a twelve times less profit than if he could turn over the same capital only once in a year. This leads to a consideration of credit.

Credit.—Credit in business is of the nature of a loan, and is founded on a confidence in the integrity of the person credited, or the borrower. An individual wishes to buy an article from a tradesman, but he has not money to pay for it, and requires to have it on credit, giving either a special or implied promise to pay its value at a future time. This is getting credit; and it is clear that the seller is a lender to the buyer. In all such cases, the seller must be remunerated for making his loan. He can not afford to sell on credit on the same favorable terms as for ready money; because, if he were to receive the money when he sold the article, he could lay it out to some advantage, or turn it over with other portions of his capital. By taking credit, the buyer deprives the seller of the opportunity of making this profit, and accordingly he must pay a higher price for the article, the price being increased in proportion to the length of credit. It very ordinarily happens that the seller himself has purchased the article on credit; but this only serves to increase its price to the consumer, and does not prevent the last seller from charging for the credit which he gives and the risk of ultimate non-payment which he runs. Credit for a short period is almost essential in all great transactions; but when going beyond fair and reasonable limits, it acts most perniciously on trade, by inducing heedless speculation, and causing an undue increase in the number of dealers with little or no capital. An excessive competition among these penniless adventurers is the consequence; each strives to undersell the other, with the hope of getting money to meet his obligations, and thus vast quantities of goods are sometimes thrown upon the market below the original cost, greatly to the injury of the manufacturer and the regular trader. What are called "gluts in the market" frequently ensue from causes of this nature.

Invoice.—A bill or account of goods, which is forwarded separately, announcing the date of their despatch and the particular conveyance by which they are sent. If the seller fail to forward an invoice by mail, and the goods be lost at sea while on their way, the purchaser is not answerable, for he is not supposed to know how or when

the goods were sent, and therefore could not insure against their loss. The careful sending of invoices forms an important duty of a merchant's clerk.

Invoices of merchandise imported into the United States are required by law to be made out in the weights, measures, and the currency of the country or place from which the importation is made, and to be verified before a consul or commercial agent of the United States, if there be such officer at the place, if not then before any public officer authorized to administer oaths.

Bill of Lading.—A formal acknowledgment or receipt given by sailing masters for goods put on board their vessels, including a promise to deliver them safely as marked and addressed to their designed destination, always, however, excepting loss or injury by the act of God, the nation's enemies, fire, or the dangers or accidents of the sea. The certificates generally in use in the United States except only the dangers of the sea, and are made out in triplicate; the master retains one bill, the shipper one, and the third is forwarded to the consignee. The receipt of a railroad freight agent, or captain of a canal or steamboat, is equivalent to a bill of lading as between the original parties, but in the hands of an assignee there is a distinction. The bill of lading is assignable, and the assignee is entitled to the goods, subject, however, to the shipper's right.

Lloyd's.—Lloyd is not the designation of any individual or of any company: it is a name used in reference to a set of subscription rooms or coffee-house, in London. Formerly the place of resort was in the Royal Exchange, but since the destruction of that building by fire, the place of meeting is in the neighborhood of that locality. One of the rooms at Lloyd's is devoted to subscribers who follow the profession of marine insurers, technically called *underwriters,* from their writing under, or subscribing to, certain obligations in deeds presented for their acceptance. When a person wishes to insure a ship, or goods in a ship, against damage or loss at sea, he offers the risk to these underwriters, and they are at liberty to accept it for a specified premium. The policy or deed expressive of the insurance is usually signed by more than one underwriter, so as to divide the risk. Lloyd's is not only a centre point in the metropolis for all sea insurance business, but is the place to which every species of intelligence respecting shipping is forwarded from all parts of the world; and this information is exhibited publicly in one of the rooms, for the inspection of all. The intelligence is for the most part sent by appointed agents, one part of whose duty consists in investigating the cause of damage to vessels and taking charge of wrecked property for behoof of the underwriters, whoever they may be. The lists made up and exhibited at Lloyd's furnish authentic information for the use of merchants and shippers of goods all over the United Kingdom.

Insolvency, Bankruptcy.—When a person is not in circumstances to pay his debts in full he is *insolvent,* which is nearly equivalent to being bankrupt; the term bankrupt, however, is more commonly applied to one who is legally announced as being insolvent. The term bankrupt is derived from *bancus,* a bench, and *ruptus,* broken, in allusion to the benches formerly used by the money-dealers in Italy, which were broken in case of their failure to pay their debts. The law prescribes a certain form of procedure in the case of commercial insolvency, which has the effect of deliberately investigating the cause of the misfortune, and relieving the bankrupt from all obligations, on yielding up his entire property. A bankrupt in the United States who has received a discharge or certificate from a competent authority, being released from all pecuniary claims, may again enter business for his own behoof without any fear of molestation; but a debtor who has merely taken the benefit of the Insolvent Act in England, or process of *cessio bonorum* in Scotland, though immediately relieved from prison and left at liberty to pursue any line of industry, the property he may accumulate is at all times liable to seizure by his former creditors.

A commission of bankruptcy in Scotland is entitled a *sequestration,* meaning that the property of the bankrupt is officially sequestrated, or taken possession of, for behoof of creditors.

Customs.—The revenue duties levied on imported goods, usually called customs duties. The place appointed by the government at ports of entry where vessels and merchandise are entered and duties upon imported goods are collected, and where vessels obtain their clearance and other papers, is called a *custom-house;* the collectors, appraisers, surveyors, naval officers, and their deputies, examiners, clerks at the head of divisions, inspectors, gaugers and weighers, but not subordinate clerks, are called *custom-house officers,* and are sworn to faithful

service; the persons who act for merchants in the business of entering and clearing goods and vessels, and in the transactions of general business, are known officially as *custom-house brokers.* A *custom-house entry* is a statement made in writing to the collector of the district, by the owners or consignees of the merchandise on board any ship or vessel, which they desire to land. While the taxes or duties laid on articles produced and consumed at home are generally qualified by the adjective "excise," and are best known in the United States as "internal revenue" taxes—the tax imposed upon retailers of liquors, wines, and beer, in the form of a license to conduct such business, emanates in many of the large cities from an appointive body known as a *Board of Excise—duties* is the official name in the United States for the taxes levied or imposed by the government on foreign goods imported into the country; also money paid to the government on exporting goods. The former is called *import duty,* the latter *export duty.* Foreign goods are said to be *bonded,* when the payment of the duties is secured by a bond, or when warehoused in a government store, and under the control of the collector of the port until entered for consumption and the duties are paid. *Bonded warehouses* are buildings in which imported merchandise is stored until the importer makes entry for withdrawal for consumption and pays the duties, or until he withdraws the merchandise for re-exportation to a foreign country without paying the duties. These stores are owned and conducted by private individuals, and their occupation is termed "the storage business." Such stores are required to be first-class fire-proof buildings, and to be used for no other business, and they must be approved by the Secretary of the Treasury before receiving any merchandise. A government officer is placed in charge of every store, at the expense of the owner, and the business is conducted under voluminous provisions and requirements established by the government. The officer of the customs detailed to take charge of a bonded warehouse, and under whose supervision bonded goods are received and delivered from the store, is called a *bonded store-keeper.* Goods, wares, and merchandise imported into the United States, subject to the payment of ad valorem duties, are required by law to be appraised at their "actual market value," at the time and place of export. As it is frequently very difficult to establish an actual market value in a foreign port, many goods being made only and expressly for foreign markets, and not sold or offered for sale at the place of their manufacture or shipment, serious litigations often arise between the merchant and the government. This difficulty has led to the recognition by the commercial world of the distinctions, cash value, market value, and intrinsic value, although the laws name but one—the "actual market value."

Tonnage Duty is a duty imposed for the purpose of revenue, and is levied upon all vessels engaged in foreign commerce, and also, except in certain cases specially exempted by law, on all vessels engaged in domestic trade. These duties are required to be paid by vessels before clearance papers will be granted, or on their arrival before permits will be given to discharge their cargoes. *Tonnage* is the gauge of a ship's dimensions, nominally understood to be the number of tons burden that a ship will carry. The rates of duty fixed by law on each article of merchandise imported from foreign countries form the *tariff,* the details of which differ with every country.

Debenture.—This is a formal certificate given by the collector of a port of entry to an importer, for drawback of duties on imported merchandise, the duties on which, when the merchandise is exported, are to be refunded. *Debentured goods* are merchandise upon which the drawback has been paid.

Bill of Entry, a written account or inventory of goods entered at the custom-house, whether imported or intended for exportation.

Bill of Sale, a writing given by the seller of goods or merchandise to the purchaser, by which the seller conveys away the right and interest he has in the goods therein named. In the United States it may be given without a seal, but the laws of Great Britain require it to be under seal.

Bill of Sight, in England, an order obtained by the consignee of goods, of the quantity and quality of which he is ignorant, to enter them by bill of sight.

Bill of Exchange.—The common bill of exchange is an order drawn on a person or banking-house, requesting him or it to pay money to some person, or to the order of a person named therein. The person who draws the bill or draft is called the *drawer;* the one on whom the demand is made is called the *drawee;* and the person to whom the money is directed to be paid is called

the *payee.* The *indorser* writes his name on the back of the bill; he to whom the bill is transferred by such indorsement is the *indorsee;* and whoever is entitled to receive the payment is the *holder.*

(Vide Forms of Commercial Papers.)

PROMISSORY NOTE.—This is a promise or engagement in writing to pay a specified sum at a time therein limited, or on demand, or at sight, to a person therein named, or his order or assigns, or to the bearer. If the note is given with a specified rate of interest, it is a negotiable note, and may be bought and sold without difficulty.

A NEGOTIABLE NOTE

$500 NEW YORK, N. Y., *Dec.* 2, 1901.

Three months after date, for value received, I promise to pay John Smith, or order, Five Hundred Dollars, with interest.

JOHN BROWN.

NOTE NOT NEGOTIABLE

$1,000 CHICAGO, ILL., *Nov.* 30, 1901.

Nine months after date, for value received, I promise to pay John Brown, One Thousand Dollars.

JOHN SMITH.

NEGOTIABLE NOTE IN MISSOURI

$100 ST. LOUIS, MO., *Oct.* 30, 1901.

Three months after date, I promise to pay to H. B. Brown, One Hundred Dollars, for value received; negotiable and payable without defalcation or discount.

GEORGE WILSON, JR.

A CASH DUE-BILL

$50 BOSTON, MASS., *Nov.* 16, 1901.

Due Ralph S. Johnson, or order, on demand, Fifty Dollars, value received.

CHAS. I. JACOBS.

A MERCHANDISE DUE-BILL

$75 SAN FRANCISCO, CAL., *Sept.* 28, 1901.

Due John F. Morton, Seventy-five Dollars, in merchandise from our store.

SMITH & TOWNLEY.

A SIGHT DRAFT

$700 NEW ORLEANS, LA., *July,* 5, 1901.

At sight, pay to the order of Mrs. Jane Wilson, Seven Hundred Dollars, value received, and charge the same to my account.

F. G. ALBERSON.

To FIRST NATIONAL BANK,
Rome, N. Y.

A TIME DRAFT

$25 SYRACUSE, N. Y., *Oct.* 1, 1901.

Thirty days after date, pay to the order of S. E. Buck, Twenty-five Dollars, value received, and charge to our account.

MOORE & RICHARDSON.

To H. V. ROSE,
Washington, D. C.

A BILL OF EXCHANGE

1

Exchange for
£500. NEW YORK, N. Y., *Dec.* 10, 1901.

Sixty days after sight of this *First* of Exchange (second and third unpaid), pay to the order of.....
Stephen G. Reynolds.....Five Hundred Pounds Sterling.....
Value received, and charge the same to account..... JOHN Y. STANTON.

To BARING BROS.,
London, Eng.

No. 172.

2

Exchange for
£500 NEW YORK, N. Y., *Dec.* 10, 1901.

Sixty days after sight of this *Second* of Exchange (first and third unpaid), pay to the order of.....Stephen G. Reynolds.....Five Hundred Pounds Sterling..... Value received, and charge the same to account. ..... JOHN Y. STANTON.

To BARING BROS.,
London, Eng.

No. 172.

3

Exchange for
£500 NEW YORK, N. Y., *Dec.* 10, 1901.

Sixty days after sight of this *Third* of Exchange (first and second unpaid), pay to the order of.....
Stephen G. Reynolds.....Five Hundred Pounds Sterling.....
Value received, and charge the same to account..... JOHN Y. STANTON.

To BARING BROS.,
London, Eng.

No. 172.

BOOK-KEEPING

THERE are, properly speaking, only two methods of book-keeping, founded on distinct principles—viz., *Single* and *Double Entry*. Single Entry is the more simple, and is generally adopted by shop-keepers and others who deal in a great variety of articles, where the sales are small and numerous; and to such it is peculiarly applicable, as they have seldom time to record them particularly. There is merely required a memorial of occurrences, in the order of time, with a Ledger, in which the names of all parties between whom transactions take place are entered; debtor and creditor accounts of each party being arranged on the two opposite pages which are presented at an opening, the first on the right hand, and the second on the left. By this method the Ledger is defective, since it contains no accounts of cash, bills, or goods; consequently it affords to the owner no knowledge of these particulars, but only records the debts due to and by him, with, at most, the accounts of stock, family expenses, and shop furniture. The Italian method of Double Entry differs from Single Entry chiefly in making cash, stock, goods, etc., parties as well as persons, and in making a debtor and creditor account in every transaction. Thus, if cloth is sold to A, A is made debtor to cloth, and cloth creditor to A; if cash is received from B, cash is made debtor to B, and B creditor to cash; and in every case the party, whether animate or inanimate, which receives is debtor to that which pays, and inversely. A double entry is therefore requisite in every transaction, and a balance may at any time be struck between things as well as persons; and in order to avoid the confusion which would arise in a direct transfer of account from the Waste-book to the Ledger before the proper relation of debtor and creditor in each transaction is distinctly ascertained and recorded, they are first entered in the Journal in the same form in which they must appear in the Ledger. But in order to form a proper criterion of the existing methods of book-keeping, it will be necessary to compare them, as we will now do, before proceeding further.

GENERAL PRINCIPLES AND SINGLE ENTRY

AS THE Ledger, when kept by Single Entry, contains no accounts of cash, bills, and goods, it consequently affords to the owner no knowledge of these particulars; but these must be collected from the subsidiary books. In a simple trade, such as the set by single entry which follows this, the information wanted may be obtained by the present arrangement of the Day Book, Cash Book, and Stock Book; but in an extensive and diversified concern this arrangement would by no means be advisable, as the objects in question could not be easily and concisely obtained. Posting from a number of books, when one only is necessary, is of itself an insuperable objection, because it is more liable to errors and omissions; and from the unsightly appearance these books would exhibit by the multiplicity of figures, the eye would soon become fatigued and bewildered. It is both a slovenly and tedious method to enter each sum singly into the Ledger, and unnecessarily swells the accounts with lines, as by the Italian method, which increase the labor and difficulty of balancing. Besides, previous to taking a general balance, the number of entries, such as interest, commission, and postage, arising from the accounts current, must unavoidably be made either with a journal entry, or each entered singly by a simple transfer from one account to another, which is, in fact, a double entry, and would be both awkward and improper. The Cash Book might be constructed with columns to show the monthly amounts of the cash received and paid on account of bills receivable and bills payable, etc.; yet the information in other respects would not be obtained, for the amounts of the sales, of consignments and shipments, etc., monthly, would not be shown by Single Entry.

Although the Ledger, by the Italian method of book-keeping, contains accounts of cash, bills, goods, and other property, yet the arrangement of it and the Journal is by no means adequate to the purposes of an extensive and complicated concern. By making all the original entries in one book, namely, the Waste Book, a jumble of transactions so heterogeneous is produced as can not fail to render the business not only more complex in itself, and consequently more difficult, than if a separate book were kept for each kind; but when despatch is required, as in selling, shipping goods, etc., the greatest inconvenience is experienced, as only one person can be employed at once in making the entries. But the principal defects lie in journalizing daily, in posting each sum singly into the Ledger, and opening separate accounts for each kind of goods. Hence the impracticability of following this method without the books of an extensive business falling behind, the patience of the book-keeper exhausted, or, perhaps, his health destroyed. Besides swelling the Journal and particularizing the Ledger to an unwieldy size, it renders the balancing of the latter a laborious and, in most cases, a difficult task.

By the practice at present followed in the counting-house, the Waste Book is not recognized by that title. It is represented, however, by a number of subsidiary books, suited to the nature of the business carried on, each containing such transactions as exclusively apply to its title. Thus, a Cash Book, in which is entered the money received and paid; a Bill Book, in which are recorded the bills received and accepted; a Purchase Book, or Invoice Book Inward, in which are entered or posted invoices of all goods purchased; a book of shipments, or Invoice Book Outward, in which are entered all goods shipped; an Account Sales Book, in which are entered the particulars of such goods as are sold on commission, with the charges attending them; a Day Book, in which are entered the sales of goods on the merchant's own account, with such other transactions as do not apply to any of the above books; an Account Current Book, containing duplicates of the accounts as they stand in the Ledger, with the particulars of each article drawn out in a plain circumstantial manner, being exact copies of the accounts transmitted or delivered to the persons whose names they bear. These are the principal subsidiary books used either in inland or foreign trade, and from which the Journal or Ledger are made. The division of the Waste Book into a number of books adapted to the nature of the business, is a valuable modern improvement, both for simplicity and despatch. By bringing each kind of transactions together, and dividing

the labor among a number of hands, the utmost simplicity, accuracy, and despatch are obtained.

The arrangement of the Journal, by combining together each class of accounts, and carrying only the amounts of these once a month into the Ledger, not only simplifies the Journal, but greatly abridges the former of these books, because no more than twelve lines yearly will be required in general at the accounts, though transactions be ever so numerous.

The Ledger, when kept by this method, may therefore be considered a general index to the Journal, as that book is to the subsidiary books. By this means the case of each account is brought into a concise point of view, and is easily examined, without fatiguing the eye with a multiplicity of figures, which unavoidably takes place when each sum is posted separately, as by the Italian method. It must also be observed that instead of opening distinct accounts for each kind of goods, as by the Italian method, only one general account of goods is by the present practice opened; for when the articles are numerous, one account of goods in the Ledger is quite sufficient, and will be found to answer every useful purpose. In an extensive business, where separate accounts for each kind of goods have been attempted, it was found difficult to keep the Journal and Ledger from falling behind. The Stock Book is the proper place for every particular of this sort, which may be kept exclusively by one of the junior clerks, when the business requires it. The result of the general account in the Ledger of goods will always correspond with the particular profits and losses from the Stock Book.

But superior as the present practice is for saving both time and labor in posting, it will be found still more so at balancing the Ledger. What was formerly a laborious, and, in some cases, next to an impracticable task, where that book was posted daily, namely, to bring the stock and balance accounts to agree (chiefly owing to the numerous entries on the property and nominal accounts), is by the present method completely avoided, and that which was before the labor of weeks can now be accomplished in as many hours or days.

It will be of more advantage to the learner to procure or prepare for himself several sheets of ruled paper, with cash columns, and enter each transaction in the order of time, than to trace the entries in the Day Book and Cash Book which we have prepared. In the first case he will find the task, as he proceeds, familiar and interesting, while his knowledge and self-reliance will be increasing; whereas, in the other case, he will acquire so superficial an acquaintance with the accounts that it will soon vanish from his memory. The Day Book is arranged so as to admit of entries being made both of sales and purchases, the former on the right side, and the latter on the left. By this means he will be taught what debit and credit entries are before he is called upon to post the Ledger, and, moreover, avoid the risk of carrying error and confusion forward to the last stage of his work. It has been observed that in an extensive business it is preferable to enter the purchases in one book and the sales in another; and by adding these up monthly the amounts of each would be shown, which would enable the owner to extend or lessen the purchases as circumstances point out. The Day Book as now given will also serve this purpose, only that instead of having separate books for the sales and purchases, they are here arranged in one, and disposed, as we have said, in the form of debtor and creditor. It therefore follows that if we add at any time to the credit side the value of the articles remaining on hand, the difference between the sums total on the two sides will show the whole gain or loss upon the goods, and by entering the charges, etc., attending the business, with the discount, both against and in favor of it, to the proper sides, this book will exhibit the result of the whole.

The following general rule is sufficient to direct the learner respecting debtor and creditor. The person from whom you buy goods on trust, or receive money, is Creditor; and, on the contrary, the person to whom you sell goods on credit, or pay money, is Debtor.

For instance, if you buy goods on credit from John Carter, he, being the deliverer, is creditor for the value, and when you pay him for them, he, being the person who receives, is debtor. On the same principle, if you sell goods on credit to Philip Meek, he, being the receiver, is debtor; and when he pays you for them, he, being the deliverer, is creditor. The same rule is observed when you contract or discharge a debt by any other transaction. Thus the person who becomes indebted to you is debtor, and the person to whom you become indebted is creditor. In the same manner, the per-

son whose debt you pay is made debtor, and he who pays a debt to you, or for you, is creditor.

In the Day Book, enter on the debtor, or left-hand, page all the purchases, with the discounts allowed by you, as these occur; also all the petty expenses, monthly. Enter on the creditor, or right-hand, page all the sales, with the discount or interest allowed to you; also the value of goods on hand at balancing.

The Cash Book.—This book is very useful, whether the Ledger be kept by Single or Double Entry, in order to show at all times the money you receive and pay, and how much at any time should remain in hand. On the debtor, or left-hand, page is entered every sum you receive; and on the creditor, or right-hand, page every sum you pay. The difference between the two sides is called the balance, which should always agree with the money remaining in hand. This book is generally added up and the amounts set down at the end of each month; and the balance is entered on the credit side to make the two sides equal, and likewise upon the debtor side of the succeeding month.

The Bill Book is divided into two parts. In the first are entered all bills which you receive, and are therefore called Bills Receivable. It is ruled with a number of columns for recording the several clauses of the bill. When kept correctly the blank spaces in the last column toward the right hand will always show the bills which remain in your possession. As soon as a bill passes out of your hands, by being either paid, discounted, or indorsed to another person, it must be marked off in the above column. In the second part are entered all the bills which you accept, or agree to pay, and are therefore called Bills Payable. As soon as you pay a bill, it should also be marked off in the column toward the right hand; when, of course, the blank spaces will just present such bills of yours as are unpaid.

A dealer who does a cash business only requires but a single book—the Cash Book. In it he enters on its appropriate side all his transactions: on the one side all he pays out, and what for, on the other all he receives and its vouchers. The balance between the two sides will at any time show the state of his affairs. Suppose, for instance, his Cash Book shows on the debtor side a total transaction of $1,450.73, and on the credit side $659.32, the difference, $791.41, is the sum which he ought to have on hand. These will appear on the Cash Book, thus:

Dr.		Cr.	
	1,450 73		659 32
		Balance.....	791 41
	1,450 73		1,450 73
To balance brought forward.....	791 41		

The transaction of which the foregoing forms a total may be like the following:

CASH

Dr.				Cr.		
1901.						
Jan. 1.	Capital.		1,000 00	Jan. 1.	Pd. Smith & Co. for 10 bbls. flour...	52 50
2.	Sales...		10 15	2.	Expenses..	20 15
3.	" ..		8 94	3.	" ..	10 00
4.	" ..		17 20	4.	" ..	19 50
5.	" ..		12 80	5.	" ..	4 25
6.	" ..		19 72	6.	" ..	1 30
8.	" ..		20 07	8.	Wages....	50 00
9.	" ..		10 15	9.	Expenses..	24 00
11.	" ..		24 44	10.	" ..	19 72
12.	" ..		18 41	11.	" ..	60 40
13.	" ..		7 16	12.	" ..	72 16
15.	" ..		9 02	13.	" ..	40 01
16.	" ..		18 27	15.	" ..	27 90
17.	" ..		21 06	16.	Wages....	50 00
19.	" ..		26 81	17.	Expenses..	27 00
20.	" ..		41 94	18.	" ..	19 25
22.	" ..		73 20	20.	" ..	7 14
23.	" ..		64 16	22.	Wages....	50 00
24.	" ..		47 23	23.	Expenses..	17 84
				24.	" ..	86 20
			$1,450 73			$659 32

A single operation will enable you to ascertain at any time the state of your affairs. Thus:

Balance of cash on hand.....	791 41
Cost of goods in stock.....	200 00
	991 41

If you owe anything on your stock, you must arrive at the result differently. Thus:

Balance of cash on hand.....	791 41
Cost of goods in stock.....	400 00
	1,191 41
Deduct amounts due for stock...	200 00
Balance as before.....	991 41

So if you give no credit, but sell only for cash over your counter, you need only the

one book, the Cash Book, which will at any time you wish, if correctly kept, show the actual state of your business.

But as very few tradesmen or dealers confine themselves to a cash business, it becomes necessary to have other books, so when credit is given a Ledger is demanded, so that the dealer may at all times know not only what cash he has on hand, but what money is owing him.

Suppose you are a bookseller, and your customers keep running accounts, you will find it necessary to have at least three books, a Cash Book, for the entries of the moneys received and paid out; a Blotter, as it is usually called, for recording the daily transactions; and a Ledger for posting the accounts.

A customer, say Mr. Robert Walpole, comes to you and asks how his account stands. Looking at the index in the front of your ledger, you find Mr. Walpole's account on page 96. Turning to this page, you discover the following statement:

MR. ROBERT WALPOLE

Dr.							1901.						Cr.	
1901. Jan.	4	8	To mdse	66	38		1901. Jan.	10	25	By cash	80	00		
	7	17	My acceptance at 3 months, dated April 10	60	00				16	Your acceptance at 3 months, due April 13..	50	00		
	10	24	Cash paid your order in favor of Brown & Co....	18	14									
				144	52						130	00		

The debtor side, or what he owes you, is $144.52, and the creditor side, or what you owe him, is $130.00; the difference, $14.52, being in your favor, is therefore his debit to you. If he pays you, enter it both on the Cash Book and on the credit side of the account in the ledger, thus making it balance.

NARRATIVE OF TRANSACTIONS	HOW THEY ARE TO BE ENTERED IN THE BOOKS
1899.	
Jan. 1. Began trade with $2,000.	This item being *Cash* in hand, must be placed on the debtor side of the Cash Book.
Bought goods as follows:	
Of J. W. Bouton.....$150 20	To be entered in the Day Book as goods bought at the time of receiving the invoices. Each name, with the relative amount of invoice, to form a separate entry.
Of Dodd, Mead & Co..... 241 00	
Of A. S. Barnes & Co..... 300 00	
Of D. Appleton & Co..... 124 30	
Sold 24 Annuals over the counter for ready money, amounting to..... 14 80	To the Dr. side of Cash Book, as ready money received for goods.
Jan. 2. Paid J. W. Bouton, Cash.... 80 00	To be entered on the Cr. side of Cash Book, each name and amount forming a separate line.
Paid Dodd, Mead & Co. ditto. 120 00	
Paid A. S. Barnes & Co. ditto. 150 00	
Paid D. Appleton & Co. ditto. 61 00	
Accepted the following bills drawn on me:	To be entered in the Bills Payable Book, on separate lines, according to the printed form sold for that purpose.
J. W. Bouton, at 2 months 40 00	
Dodd, Mead & Co., at 2 months..... 90 00	
A. S. Barnes & Co., at 3 months..... 60 00	
D. Appleton & Co., 1 month..... 40 00	
Bought of A. D. F. Randolph, goods, value..... 198 64	As before.

Jan. 3.	Sold Tenter & Co., of Philadelphia, as follows:		
	120 Dodd, Mead & Co.'s Hand Books, at 20c..... 24 00		To be charged in the Day Book, explaining every particular relating to the conditions of sale, and how forwarded.
	80 Novels..... 26 00		
	40 Assorted Books.. 24 00		
		74 00	
	Terms, half Cash, half Bills at 3 months.		
	Received from Tenter & Co.'s house in town, cash.	36 20	To be entered in Cash Book as cash received for account of Tenter & Co., Philadelphia.
	Idem, bill at 3 months.....	36 20	To be entered in the Bills Receivable to the account of Tenter & Co., Philadelphia, according to the printed forms.
	Sold B. Flock, of Pittsburg, 42 assorted books.....	50 80	As before.
	Received from Flock's house in town, cash.....	20 00	As before.
	And a bill at 3 months date.	30 80	As before.
Jan. 4.	Sold Roberts Bros., Boston, 36 Elements of Commerce.	74 32	As before.
	Received from Roberts Bros., of New York, for account of their house in Boston, their acceptance at two months for.....	74 32	As before.
	Paid A. D. F. Randolph on account of what I owe him:		This is a very peculiar entry, and one which persons ignorant of book-keeping will find comparatively difficult to arrange. As it is, however, a transaction which occurs continually, due attention ought to be given to it.
	Bill paid to me by Flock..... 30 80		There are two ways of entering it—one by the Cash Book, the other by the Day Book. If by the *former*, the amount must be first entered on the Dr. side as received for the bills, and then the Cr. side as paid to the parties. This, however, is a mode I do not like, because, in the first place, it is *not* a cash transaction at all; and, secondly, because an entry on the Dr. side of the Cash Book is obliged to be *created* in order to balance the other on the Cr. side. An entry by the Day Book is far the best, as nothing more is necessary than to charge the person to whom the bills are paid, with the amount of them, in the same way as for goods sold. The latter method is the one adopted in the examples.
	Bill paid to me by Roberts Bros.. 74 32		
	Together.....	105 12	
	Bought of W. H. Vernon, 20 reams of paper.....	170 00	Day Book, as before.
	Sold him 240 odd volumes all at.....	82 30	As before.
	Sold for ready money over the counter, 6 vols. Hume and Smollett's History of England	6 60	As before.
Jan. 6.	Paid trade charges and wages this day.....	4 22	To be entered on the Cash Book, under the head of Trade Expenses.
	Paid expenses to this day..	6 60	Idem.
Feb. 5.	Paid cash for my acceptance to D. Appleton & Co.....	40 00	To be entered in the Cash Book to the charge of *Bills Payable*, specifying the number of the Bill, D. Appleton & Co. having been debited with the amount when my acceptance was given.
Mar. 5.	Idem to J. W. Bouton.....	40 00	Idem.
	Idem Dodd, Mead & Co....	90 00	Idem.
Apr. 5.	Idem A. S. Barnes & Co....	60 00	Idem.

	6. Received the amount of Tenter's acceptance, paid me on the 3d Jan.....	36 20	To be entered in the Cash Book to the account of *Bills Receivable*, specifying the number, Tenter & Co. having been credited for the Bill when I received it from them.
	7. Flock's acceptance returned to me by A. D. F. Randolph, to whom I had paid it, it not having been honored by the acceptor.....	30 80	As I was obliged to take up this Bill, in other words to pay it, for account of Flock, who ought to have paid it, I charge Flock in the Cash Book with the amount I pay to A. D. F. Randolph.
	8. Paid one month's Rent.....	80 00	In the Cash Book, in the same way I entered trade and other expenses.
	Income Tax	20 24	
	City Taxes.	15 20	
Nov.	1. Sold the following goods:		
	Ramsden & Co.....	20 00	To be entered in the Day Book, as before.
	S. Green.....	18 24	
	G. Barrows.....	80 00	
	W. Sinn.....	120 00	
	V. S. Brown.....	74 20	
Dec.	1. Received the following acceptances, at three months:		
	Ramsden & Co.....	20 00	To be entered in the Bills Receivable Book, as before.
	S. Green.....	18 24	
	G. Barrows.....	80 00	
	W. Sinn.....	120 00	
	V. S. Brown.....	74 20	
Dec.	20. Bought goods as follows:		
	From Leggat Bros.....	52 20	To be entered in the Day Book, as before.
	From Houghton, Mifflin & Co.....	200 00	
	From S. R. Wells.....	192 40	
	From James R. Osgood & Co.....	170 80	
Dec.	30. Gave my acceptances as follows, at three months:		
	Leggat Bros.....	52 20	To be entered in the Bills Payable Book, as before.
	To Houghton, Mifflin & Co.	200 00	
	To S. R. Wells.....	192 40	
	To James R. Osgood & Co.	170 80	

Having entered all these various items in their proper books, as explained, we proceed to transfer them under their respective heads in the Ledger, which is technically called POSTING. First, taking the Day Book, we *post* all under the date of the 1st of January; then follows the Cash Book in the same way, and finally the two Bill Books, care being taken to mark the proper page of the Ledger in the columns left for that purpose in the other books, and *vice versa* to note in the Ledger, in like manner, the folio of the book from which the entry has been extracted. Thus, day by day, all the entries in the Ledger are condensed from these four books.

All the items contained in the Cash Book, Bills Receivable and Payable Books, and Day Book having been properly *posted* in the Ledger, the next operation will be to BALANCE! This is generally done on the last day of the year, at which time the value of the stock on hand is taken. By reference to the Ledger, it will be seen how those accounts are ruled off which balance of themselves, and in what way the balances of the others are brought down, some being amounts we owe, and others due to us. The balances due us stand upon the Debtor side, those we owe on the Creditor side.

Having done this, we next proceed to draw up the Balance Sheet, by which we shall ascertain the amount of profit made or loss incurred upon the year's transactions, after having paid all expenses and trade charges. In order to do this properly, we must collect into one sum *all we owe*, and into another *all we are possessed of*, and the difference between the two will be the amount we are worth. The amounts *we owe* are to be found in the Ledger and the Bills Payable Book. The amounts *due*

to us in the Ledger, also, and the Bills Receivable Book. Besides these we must reckon as assets, Cash in hand, as will appear by balancing Cash Book, and Stock on hand, which must be taken at a proper valuation. Below will be found a GENERAL BALANCE SHEET, drawn up according to these instructions.

Dr. BALANCES *Cr.*

AMOUNTS DUE TO ME, OR ASSETS — 31st December, 1901 — AMOUNTS I OWE, OR LIABILITIES

Folio in Ledger	Accounts extracted	Balances as per Ledger		Folio in Ledger	Accounts extracted	Balances as per Ledger	
7	B. Flock	$30	80	1	J. W. Bouton	$30	20
				2	Dodd, Mead & Co.	31	00
				3	A. S. Barnes & Co.	90	00
				4	D. Appleton & Co.	22	60
				5	A. D. F. Randolph	82	60
				6	W. H. Vernon	87	00
	Amount of book debts due *to* me	$30	80		Amount of book debts due *by* me	$343	40
	* Bills Receivable in my hands not yet due	312	44		Bills accepted by me not yet due*	614	40
	Balance of Cash in hand	1,315	80				
	Estimated value of stock in hand	1,390	28		Balance carried down	2,090	44
		$3,049	24			$3,049	24
	Balance in my favor	$2,090	44				
	Which shows that after paying house and trade charges, rent and taxes, I have made a clear net profit of $90.44 on my capital of $2,000.						

* Enumerate each item — * Enumerate each bill separately

Dr. CASH BOOK *Cr.*

1901					1901				
Jan. 1	*	To Capital	$2,000		Jan. 2	1	By am't paid J. W. Bouton	$80	00
	*	Cash received for goods (ready money)	14	80		2	———— Dodd, Mead & Co.	120	00
3	6	Tenter & Co., received for account of their house in Baltimore	36	00		3	———— A. S. Barnes & Co.	150	00
	7	B. Flock	20	20		4	———— D. Appleton & Co.	62	00
4	*	Cash received for goods (ready money)	6	60	6	*	By Trade Charges, Expenses, and Wages to this day	11	20
			$2,067	60				$423	20
							Balance to next month	$1,654	40
								$2,077	60
Feb. 1		To Balance	$1,654	40	Feb. 5	*	By Bill Payable, No. 104, due this day	$40	00
			$1,654	40			Balance	1,614	40
								$1,654	40
March 1		To Balance	$1,614	40	March 5	*	By Bill Payable, No. 101, due this day	$40	00
			$1,614	40		*	By Bill Payable, No. 102, due this day	90	00
								130	00
April 1		To Balance	$1,484	40			Balance	$1,484	40
6	*	Bill receivable, No. 101, received in cash, this day	38	24				$1,614	40
			$1,522	04	April 5	*	By Bill Payable, No. 103, due this day	$60	00
May 1		To Balance	$1,315	80	7	7	A. D. F. Randolph for Flock's Acceptance, due this day returned unpaid	30	80
					8		One month's rent due this day	80	00
						*	———— Income Taxes	20	24
							———— City Taxes	15	20
								$206	24
							Balance	1,315	80
								$1,522	04

NOTE.—The amounts marked in the folio margin with a star, are not by *single* entry posted in the Ledger; the Cash Book alone, under *that* system, being quite sufficient for their registry. Only accounts with *persons* are kept; not with *things* as in Double Entry. At the same time they may, if wished, be posted under their respective heads as matters of reference, but care must be taken not to include them in the Balance, of which they form no part.

DAY BOOK

Folio in Ledger			
	——January 1, 1901——		
1	Bought of J. W. Bouton Goods as per invoice.....	$150	20
2	Bought of Dodd, Mead & Co. Goods as per invoice.....	$240	10
3	Bought of A. S. Barnes & Co. Goods as per invoice.....	$300	00
4	Bought of D. Appleton & Co. Goods as per invoice.....	$124	60
	—2d—		
5	Bought of A. D. F. Randolph Goods as per invoice.....	$188	60
	—3d—		
6	Sold Tenter & Co Half Cash Half Three Months' Bill		
	120 Dodd, Mead & Co.'s Hand Books.....	$24	00
	80 Novels.....	26	00
	40 Books (assorted).....	24	00
		$74	00
	Forwarded by Union Ex.		
7	Sold B. Flock 84 Assorted Books.....	$50	80
	—4th—		
8	Sold Roberts Bros. 72 Elements of Commerce. Forwarded per U. S. Express	$74	32
5	Paid A. D. F. Randolph Flock's Acceptance, due April 7.....	$32	80
	Roberts Bros'. Acceptance, due March 7.....	74	32
		$107	12

DAY BOOK—*Continued*

Folio in Ledger			
	——January 4, 1901——		
9	Bought of W. H. Vernon 200 Reams of Paper.....	$170	00
9	Sold W. H. Vernon 240 Odd Volumes all for	$82	30
	——November 1st——		
10	Sold Ramsden & Co. Books	$20	00
11	Sold S. Green Books	$18	24
12	Sold G. Barrows Books	$80	00
13	Sold W. Sinn Books	$120	00
14	Sold V. S. Brown Books	$74	20
	——December 20th——		
15	Bought of Leggat Bros. Goods as per invoice.....	$52	00
16	Bought of Houghton, Mifflin & Co. Goods as per invoice.....	$200	00
17	Bought of S. R. Wells Goods as per invoice.....	$192	40
18	Bought of J. R. Osgood & Co. Goods as per invoice.....	$170	80

N.B.—The folios should be marked in *red* ink.

1901 BILLS RECEIVABLE

Folio	Number of Bill	On whose account	Date	Time	When due	Amount
6	101	Tenter & Co.....	January 3	3 months	April 6	$36 20
7	102	B. Flock.....	——— 4	3———	——— 7	32 50
8	103	Roberts Bros.....	——— 4	2———	March 7	74 32
						$143 32
					1900	
10	104	Ramsden & Co.....	December 1	3———	March 4	20 00
11	105	S. Green.....	——— 1	3———	——— 4	18 24
12	106	G. Barrows.....	——— 1	3———	——— 4	80 00
13	107	W. Sinn.....	——— 1	3———	——— 4	120 00
14	108	V. S. Brown.....	——— 1	3———	——— 4	74 20
						$312 44

1901 BILLS PAYABLE

Folio	Number of Bill	By whom drawn	Date	Time	When due	Amount
1	101	J. W. Bouton.....	January 2	2 months	March 5	$40 00
2	102	Dodd, Mead & Co.....	——— 2	2———	——— 5	90 [illegible]
3	103	A. S. Barnes & Co.....	——— 2	3———	April 5	60 00
4	104	D. Appleton & Co.....	——— 2	1———	Feb. 5	40 00
						$230 00
					1900	
15	105	Leggat Bros.....	December 30	3———	April 2	$52 20
16	106	Houghton, Mifflin & Co.....	——— 30	3———	——— 2	200 00
17	107	S. R. Wells.....	——— 30	3———	——— 2	192 40
18	108	James R. Osgood & Co.....	——— 30	3———	——— 2	170 80
						$615 40

THE LEDGER

Folio 1

J. W. BOUTON

Dr.						Cr.					
1901.						1901.					
Jan.	2	1	To cash	$80 00		Jan.	1	1	By goods	$150 20	
	2	1	To balance carried down	40 00							
Dec.	31		To bills payable, No. 101	30 20							
				150 20						150 20	
						Dec.	31		By balance brought down	150 20	

Folio 2

DODD, MEAD & CO.

Dr.						Cr.					
1901.						1901.					
Jan.	2	1	To cash	$120 00		Jan.	1	1	By goods	$241 00	
	2	1	To bills payable, No. 102	90 00							
Dec.	31		To balance carried down	31 00							
				241 00						241 00	
						Dec.	31		By balance brought down	31 00	

Folio 3

A. S. BARNES & CO.

Dr.						Cr.					
1901.						1901.					
Jan.	2	1	To cash	$150 00		Jan.	1	1	By goods	$300 00	
	2	1	To bills payable, No. 103	60 00							
Dec.	31		To balance carried down	90 00							
				300 00						300 00	
						Dec.	31		By balance brought down	90 00	

Folio 4

D. APPLETON & CO.

Dr.						Cr.					
1901.						1901.					
Jan.	2	1	To cash	$62 00		Jan.	1	1	By goods	$124 60	
	2	1	To bills payable, No. 104	40 00							
Dec.	31		To balance carried down	22 60							
				124 60						124 60	
						Dec.	31		By balance brought down	22 60	

Folio 5

A. D. F. RANDOLPH

Dr.						Cr.					
1901.						1901.					
Jan.	4	1	To two bills receivable, paid them	$106 00		Jan.	1	1	By goods	$188 60	
Dec.	31		To balance carried down	82 60							
				188 60						188 60	
						Dec.	31		By balance brought down	82 60	

Folio 6

TENTER & CO., PHILADELPHIA

Dr.						Cr.					
1901.						1901.					
Jan.	3	1	To goods	$72 40		Jan.	3	1	By cash	$36 20	
								1	By bill receivable, No. 101	36 20	
				$72 40						72 40	

Folio 7

W. SINN, PARTSBURG, WEST VA.

Dr.						Cr.					
1901.						1901.					
Jan.	3	1	To goods	$50 80		Jan.	3	11	By cash	$20 00	
April	7	1	To your acceptance returned unpaid	30 80			4	1	By bill receivable, No 102	30 80	
						Dec.	31		By balance carried down	30 80	
				81 60						81 60	
Dec.	31		To balance brought down	30 80							

Folio 8 — ROBERTS BROS., Boston

Dr.							Cr.					
1901. Jan.	4	1	To goods	$74	32		1901. Jan.	6	1	By bill receivable, No. 103.	$74	32

Folio 9 — W. H. VERNON

Dr.							Cr.					
1901. Jan.	4	1	To goods	$82	30		1901. Jan.	4	1	By goods	$169	30
Dec.	31		To balance carried down	87	00							
				169	30						169	30
							Dec.	31		By balance brought down	87	00

Folio 10 — RAMSDEN & CO

Dr.							Cr.					
1901. Nov.	1	1	To goods	$20	20		1901. Dec.	1	1	By bill receivable, No 104.	$20	20

Folio 11 — S. GREEN

Dr.							Cr.					
1901. Nov.	1	1	To goods	$18	24		1901. Dec.	1	1	By bill receivable, No. 105.	$18	24

Folio 12 — GEORGE BARROWS

Dr.							Cr.					
1901. Nov.	1	1	To goods	$80	00		1901. Dec.	1	1	By bill receivable, No. 106	$80	00

Folio 13 — W. SINN

Dr.							Cr.					
1901. Nov.	1	1	To goods	$120	00		1901. Dec.	1	1	By bill receivable, No. 107.	$120	00

Folio 14 — V. S. BROWN

Dr.							Cr.					
1901. Nov.	1	1	To goods	$74	20		1901. Dec.	1	1	By bill receivable, No. 108.	$74	20

Folio 15 — LEGGAT BROS

Dr.							Cr.					
1901. Dec.	30	1	To bill payable, No. 105.	$52	20		1901. Dec.	30	1	By goods	$52	20

Folio 16 — HOUGHTON, MIFFLIN & CO.

Dr.							Cr.					
1901. Dec.	30	1	To bill payable, No. 106.	$200	00		1901. Dec.	30	1	By goods	$200	00

Folio 17 — S. R. WELLS

Dr.							Cr.					
1901. Dec.	30	1	To bill payable, No. 107.	$192	40		1901. Dec.	30	1	By goods	$192	40

Folio 18 — JAMES R. OSGOOD & CO.

Dr.							Cr.					
1901. Dec.	30	1	To bill payable, No. 108.	$170	80		1901. Dec.	30	1	By goods	$170	80

After the Ledger has been duly examined, and it is seen that the balances are struck and brought down correctly, proceed to observe if those balances are transferred properly to the general BALANCE SHEET at page 819, which is the last operation of all.

Beyond this, Book-keeping by Single Entry "can no further go." It is only a confined system, and its results are never demonstrated or proved. Errors of omission, of addition, and of wrong posting, may, and in large establishments *do*, frequently occur without any means of detection, except the tiresome and frequently fallacious method of a re-examination of the entire books by another person. But by Double Entry, provided the system be a correct one, no error of any kind can escape without detection, because everything is verified by an infallible rule. Nevertheless the diligent study of the method of Single Entry is absolutely necessary as a preparatory step toward acquiring a knowledge of the other. No one can keep a set of books by Double Entry who does not understand Single Entry, because the one is based upon the other. When the learner has well studied what has already been laid before him, let him pass on to the following pages, where he will find *the same transactions* registered by Double Entry.

BOOK-KEEPING BY DOUBLE ENTRY

This method differs from the former chiefly in making cash, stock, goods, etc., parties, as well as persons, and in making a debitor and creditor account in every transaction. Thus, if cloth is sold to A, A is made debtor to cloth, and cloth creditor to A; if cash is received from B, cash is made debtor to B, and B creditor to cash; and in every case the party, whether animate or inanimate, which receives is debtor to that which pays, and inversely. In Single Entry the record is single, and there it ends, whereas in Double Entry every transaction has a debit and credit, and every account in which it is not so represented is imperfect. Two parties are necessarily engaged in every transaction, and therefore each of them requires in his Ledger two separate accounts, one for himself, and a second for his customer or furnisher, as the case may be. Now, by the use of what are called nominal accounts representing the proprietor in his own Ledger, the double receptacle is provided which every transaction requires. The nominal accounts receive the counter entries of all the personal accounts, and through their operation the merchant is enabled to ascertain whether his business is profitable or the reverse. These accounts are those of Stock, Profit and Loss, and its branches. Stock is a term used to represent the proprietor, and it contains on the credit side the amount of the money, goods, or other property brought into trade; and on the debtor, the owner's liabilities. In Profit and Loss, the credit side exhibits the gain of the business, and the debit the loss. In Single Entry, nominal accounts have no place. There is a record only of the side of the accounts belonging to the person dealing with the concern, and none whatever of that which represents the owner. Such a method enables us to balance the accounts of each party, but exhibits no register by which the state of the stock in trade, and the balances of capital and cash, can be at once ascertained without a separate and independent investigation.

We have seen, that by Single Entry the items are transferred from the Cash Book, Day Book, and Bill Books, *at once*, into the Ledger; but in Double Entry, another book, called the JOURNAL, is necessarily used, in which the items from all the others are first arranged in proper form, and *then* passed into the Ledger. Thus, *posting* by Single Entry is done from several books; whereas from Double Entry from the Journal alone.

The old Italian method of keeping a Journal is fraught with so many crudities, useless repetitions, and technical jargon, that it has been long abandoned for one a thousand-fold more simple in its construction, and perfect in its results. Instead of continually entering "Sundries Dr. to Cash," "Interest Dr. to Sundries," "Commission Dr. to A. B. C.," and "D. E. F. Dr. to Commission," with a multitude of such anomalies, the Journal is divided into two parts (the right and left hand side of the book), the one called the Debtor side and the other the Creditor side. Under the Debtor side must be entered uninterruptedly everything that is to be debited; and under the Creditor side, everything that is to be credited; and both sides must agree, if the entering has been done correctly.

In addition to the *simplicity* of this arrangement, there are other advantages which may not be overlooked. In the first place, *all* the entries on one side of the Journal are posted upon the same side in the Ledger, a convenience which every book-keeper will know how to prize. Next, all the items for

each account in a month are consolidated in *one* entry previous to posting, thus greatly reducing that labor, and offering the phenomenon of a Ledger wherein no account for one year can have more than twelve lines, one for each month; and, finally, the totals of each month in the Journal added together must correspond with the gross amount of all the totals in the Ledger, the last and surest demonstration of correctness which figures can offer.

Let us proceed to *Journalize* according to this method all the entries contained in the preceding Day Book, Cash Book, Bills Payable Book, and Bills Receivable Book (for which see pages 819, 820), begging the learner meanwhile to recollect the following rules:

1st. When Goods are *sold*, the buyers must be debited and Trade Account credited with the amount.

2d. When goods are *bought* Trade Account must be debited and the sellers credited for the amount.

3d. When Cash is *paid*, the parties receiving it must be debited and Cash Account credited, and when it is *received* the Account must be debited and the payers credited.

4th. When Acceptances are *given*, the persons on whose account they are drawn must be debited, and Bills Payable credited; and when they are *received* Bills Receivable must be debited and the party on whose account they are received must be credited.

5th. When Accepted Bills become due and are paid, Bills Payable must be debited and Cash credited, and when Bills to be received become due and are paid, Cash must be debited with the amount, and Bills Receivable credited.

Finally. No entry can be made in the Ledger unless it be extracted from the Journal, consequently everything must go into the Journal first.

These rules must be most carefully heeded in order to rapidly acquire the science of book-keeping.

Dr. **JOURNAL,** January, 1901. *Cr.*

Tenter & Co.	3. Goods sold as per invoice		74 00	J. W. Bouton.	1. Goods as per invoice.	150	20
D. Flock.	3. Goods sold as per invoice		50 80	Dodd, Mead & Co.	1. Goods as per invoice.	241	00
Roberts Bros.	4. Goods sold as per invoice		74 32	A. S. Barnes & Co.	1. Goods as per invoice.	300	00
A. D. F. Randolph.	4. Paid them Bill Receivable, No. 102.... 30 80			D. Appleton & Co.	1. Goods as per invoice.	124	60
	Idem 103... 74 32			A. D. F. Randolph.	2. Goods as per invoice.	186	60
		105	12	W. H. Vernon.	4. Goods as per invoice.	170	00
W. H. Vernon.	4. Goods, as per invoice		82 82	Bills Payable.	31. Amount of Bills accepted this month as per Bill Book.	233	00
J. W. Bouton	2. Bill Payable, No. 101..... 40 00			Tenter & Co.	3. Bill Receivable, No. 101.....36 20		
	Cash paid them. 80 00				Cash Received ..36 20		
		120	00			72	40
Dodd, Mead & Co.	2. Bill Payable, No. 102 ..... 90 00			B. Flock.	4. Bill Receivable, No. 102.....30 80		
	Cash paid them. 120 00				3. Cash Received. 20 00		
		210	00			50	80
A. S. Barnes & Co.	2. Bill Payable No. 103.... 60 00			Roberts Bros.	4. Bill Receivable, No. 102.....	74	32
	Cash paid them. 150 00			Trade Account.	1. Cap'al invested this day 2,000		
		210	00		Goods sold this month:		
D. Appleton & Co.	2. Bill Payable, No. 104.... 40 00				3. To Tenter & Co. 74 00		
	Cash paid them. 62 00				3. Flock 50 80		
		102	00		4. Roberts Bros. 74 32		
Bills Receivable.	31. Am't received this month as per Bill Receivable book..	142	20		W H. Vernon. 82 30		
Cash.	31. Am't received this month as per Cash Book.....	2,076	34		1. Cash received. 14 80		
					4. Ditto 6 60		
Trade Account.	Goods bought this month:					2,302	82
	1. Of J. W. Bouton ...150 20			Cash.	31. Amount paid this month as per Cash Book	420	42
	1. Dodd, Mead & Co.....241 00			Bills Receivable.	4. No. 102, paid A. D. F. Randolph 30 80		
	1. A. S. Barnes & Co.....300 00				No. 103, paid A. D. F. Randolph 74 32		
	1. D. Appleton & Co.....124 60					105	12
	4. A. D. F. Randolph 186 60						
	4. W. H. Vernon 170 00						
	6. Cash paid charges as per Cash Book 10 28						
		1,182	68				
		4,430	28			4,430	28

Dr. **JOURNAL (continued)** *Cr.*

		February,			1901.		
Bills Payable	5. Cash paid, No. 104.	40	00	Cash.	26. Amount paid this month as per Cash Book	40	00
		March,			1901.		
Bills Payable	5. Cash paid No. 102.	90	00	Cash.	31. Amount paid this month as per Cash Book	130	00
	5. Cash paid No. 102.	40	00				
		130	00			130	00
		April,			1901.		
Bills Payable.	5. Cash paid No. 103.	60	00	Cash.	30. Amount paid this month, as per Cash Book.....	206	44
B. Flock.	7. His bill returned unpaid	30	80	Bills Receivable.	6. Cash received, No. 101	36	00
Charges on Trade.	8. Cash for rent. 80 00 Taxes 20 24 Taxes 15 20	115	44				
Cash.	30. Am't received this month per Cash Book	36	20				
		242	44			242	44
		November,			1901.		
Ramsden & Co.	1. Goods sold them...	20	00	Trade Account.	Goods sold this month:		
S. Green.	1. Goods sold him....	18	24		1. To Ramsden & Co 20 00		
G. Barrows.	1. Goods sold him....	80	00		1. S. Green.... 18 24		
W. Sinn.	1. Goods sold him....	120	00		1. G. Barrows.. 80 00		
V. S. Brown.	1. Goods sold him....	74	20		1. W. Sinn...120 00		
					1. V. S. Brown. 74 20		
						312	44
		312	44			312	44
		December,			1901.		
Trade Account.	20. Goods bought this month:			Leggat Bros.	20. Goods b'ght by him.	52	20
	Of Leggat Bros.. 52 20			Houghton, Mifflin & Co	20. Idem	200	00
	Houghton, Mifflin & Co...200 00			S. R. Wells.	20. Idem	192	40
	S. R. Wells..192 40			J. R. Osgood & Co.	20. Idem	170	80
	J. R. Osgood & Co.....170 80			Bills Payable.	30. Bills accepted this month, as per Bill Book	615	40
		615	40	Ramsden & Co.	1. Bill Rec'le, No. 104.	20	00
Leggat Bros.	30. Bill Pay'le, No, 105.	52	20	S. Green.	1. Idem No. 105.	19	84
Houghton, Mifflin & Co	30. Idem 106.	200	00	G. Barrows.	1. Idem No. 106.	80	00
S. R. Wells.	30. Idem 107.	192	40	V. S. Brown.	1. Idem No. 107.	120	00
J. R. Osgood.	30. Idem 108.	170	80	W. Sinn.	1. Idem No. 108.	74	20
Bills Receivable.	31. Am't received this month, as per Bill Book	314	04				
		1,544	84			1,544	84

THE LEDGER

Wherein the contents of the preceding Journal are posted

Dr. TENTER & Co *Cr.*

1901 Jan.	3. To Goods.....	74	00	1901 Jan.	31. By Sundries.....	74	00

Dr. B. FLOCK *Cr.*

Jan.	3. To Goods.....	50	80	Jan.	31. By Sundries.....	50	80
April	7. To Bill returned.....	30	80		By Balance.....	30	80
		81	60			81	60
	To Balance.....	30	80				

Dr. ROBERTS BROS. *Cr.*

Jan.	4. To Goods.....	74	32		By Bill Receivable.....	74	32

Dr. A. D. F. RANDOLPH

Jan.	4. To Sundries.....	106	00	Jan.	2. By Goods.....	188	60
	To Balance.....	82	60				
		188	60			188	60
					By Balance.....	82	60

THE LEDGER (continued)

Dr.	W. H.		Cr.	VERNON
Jan. 4. To Goods	82 30	Jan. 4. By Goods	169 30	
To Balance	87 00			
	169 30		169 30	
		By Balance	87 00	

Dr.	J. W.		Cr.	BOUTON
Jan. 2. To Sundries	120 00	By Sundries	150 20	
To Balance	30 20			
	150 20		150 20	
		By Balance	30 20	

Dr.	DODD,		Cr.	MEAD & CO.
Jan. 2. To Sundries	210 00	Jan. 4. By Sundries	241 00	
To Balance	31 00			
	241 00		241 00	
		By Balance	31 00	

Dr.	A. S. BAR		Cr.	NES & CO.
Jan. 2. To Sundries	210 00	Jan. 1. By Goods	300 00	
To Balance	90 00			
	300 00		300 00	
		By Balance	90 00	

Dr.	D. AP		Cr.	PLETON & CO.
Jan. 2. To Sundries	102 00	Jan. 1. By Goods	124 60	
To Balance	22 60			
	124 60		124 60	
		By Balance	22 60	

Dr.	BILLS		Cr.	RECEIVABLE
Jan. 31. To Sundries	142 20	Jan. 31. By Sundries	106 00	
Dec. 31. Idem	314 40	April 30. Idem	36 20	
			142 20	
		Balance	314 40	
	456 60		456 60	
To Balance	314 40			

Dr.	CASH		Cr.	ACCOUNT
Jan. 31. To Sundries	2,076 34	Jan. 31. By Sundries	422 28	
April 30. Idem	36 20	Feb. 29. Idem	40 00	
		Mar. 31. Idem	130 00	
		April 30. Idem	206 40	
			798 68	
		Balance	1,313 86	
	2,112 54		2,112 54	
To Balance	1,313 86			

Dr.	TRADE		Cr.	ACCOUNT
Jan. 31. To Sundries	1,184 34	Jan. 31. By Sundries	2,304 40	
April 30. Idem	114 36	Nov. 30. Idem	308 84	
Dec. 31. Idem	614 34			
	1,913 04			
Balance	700 20			
	2,613 24		2,613 24	
		By Balance	700 20	

Dr.	BILLS		Cr.	PAYABLE
Feb. 28. To Sundries	40 00	Jan. 31. By Sundries	230 00	
Mar. 31. Idem	130 00	Dec. 31. Idem	614 34	
April 30. Idem	60 00			
	230 00			
Balance	614 34			
	844 34		844 34	
		By Balance	614 34	

Dr.	RAMSDEN		Cr.	& CO.
Nov. 1. To Goods	20 00	Dec. 1. By Bill Receivable	20 00	

Dr.	S.		Cr.	GREEN
Nov. 1. To Goods	18 24	Dec. 1. By Bill Receivable, No. 105.	18 24	

THE LEDGER (continued)

Dr. G.	BERGER *Cr.*
Nov. 1. To Goods..... 80 00	Dec. 1. By Bill Receivable, No. 106..... 80 00
Dr. W.	SINN *Cr.*
Nov. 1. To Goods..... 120 00	Dec. 1. By Bill Receivable, No. 107..... 120 00
Dr. V. S.	BROWN *Cr.*
Nov. 1. To Goods..... 74 20	Dec. 1. By Bill Receivable, No. 108..... 74 20
Dr. LEGGAT	BROS. *Cr.*
Dec. 30. To Bill Payable, No. 105..... 52 20	Dec. 20. By Goods..... 52 20
Dr. HOUGHTON,	MIFFLIN & CO. *Cr.*
Dec. 30. To Bill Payable, No. 106..... 200 00	Dec. 20. By Goods..... 200 00
Dr. S. R.	WELLS *Cr.*
Dec. 30. To Bill Payable, No. 107..... 192 40	Dec. 20. By Goods..... 192 40
Dr. JAS. R. OSGOOD	& CO. *Cr.*
Dec. 30. To Bill Payable, No. 108..... 170 80	Dec. 20. By Goods..... 170 80

In the preceding Ledger we have posted under the head of Trade Account all goods bought and charges incurred (both in business and family matters) to the Debit; and to the Credit, the amount of the capital and goods sold, consequently the balance of this account added to the amount of stock on hand always shows the profit of the business. For instance:

Balance of the account.....	700 16
Value of stock on hand, as estimated in the Balance Sheet by *Single* Entry.....	1,390 28
Total balance in my favor as shown in the Balance Sheet by *Single* Entry.....	2,090 44

But in partnership accounts, such a plan would not do, because domestic expenses can not be charged to trade, nor should the respective capitals be included. In such cases separate accounts must be opened for each individual, which must be credited with their separate capitals and debited with their relative charges. At the end of the year, a balance is struck, the profit or loss determined, and the sum total divided into proper proportions, and transferred from the general Trade or Profit and Loss Account, to each individual's debit or credit, as the case may be.

N. B.—A Profit and Loss *Account is merely another name for a Trade Account. All bad debts must be charged to that Account which shows the Profit and Loss (whatever the name may be), and the bad Accounts themselves closed by transfer.*

Let us now see if the Ledger is correct. To determine this, first extract all the totals, *Dr. Cr.* (before the balances are struck) which must not only agree with each other, but correspond as well with the sum totals in the Journal. Put all the amounts at debit on one side, and the amounts at credit on the other. The totals must agree with the totals in the Journal. If this prove to be the fact, it is thus *demonstrated* that everything in the Journal has been posted in the Ledger.

Having thus seen that the totals on both sides of the Ledger not only agree with each other, but correspond as well with those of the Journal, which is *proof positive* that the books are correct, the next and last care will be to see that both sides agree.

NOTE.—The foregoing explains the system generally preferred by accountants, but a more recent method, requiring less labor, and often preferred, provides for transferring direct from the original books of entry to the ledger; and the journal is used merely for recording such itmes as are not found in any of the other original books. A journalized day-book often takes the place now of the former day-book.

THE LIGHTNING CALCULATOR

THE following tables show at a glance the price of any number of articles at any given rate: The first column of figures shows the number of articles, and the second, the total; *e.g.*, 87 articles at ¼ cent each, amount to 21¾ cents; 46 articles at 56¼ cents each, give for a total $25.87½. If the price be one not given in the tables, the sum is easily ascertained by adding together two or more of those which are given, thus: 23 articles at 19¾ cents, 23 at 10 cents would be 2.30, at 5 cents 1.15, at 2 cents 46 cents, at ½ 11½ cents, and at ¼ 5¾; adding these totals, 2.30 + 1.15 + 46 + 46 + 11½ + 5¾ = $4.54¼, the amount sought for.

These tables, too, will operate in other directions, and show the number of articles, when the total amount and the price per capita are given; also when the number of articles and the total amount are given, the price per capita is easily ascertained.

When fractions of a cent are involved, it is often confusing to an inexpert accountant to readily compute the amount. A reference to these tables will quickly give the required result, thereby saving that which is so important to the business man—time.

The convenience of these tables can not be overrated. Not only do they save time, but are also conducive to perfect accuracy, a result which is not always certainly obtained in a hurried calculation.

At ¼ Cent

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.	No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	. ¼	18	.4½	35	. 8¾	52	.13	69	.17¼	86	.21½
2	. ½	19	.4¾	36	. 9	53	.13¼	70	.17½	87	.21¾
3	. ¾	20	.5	37	. 9¼	54	.13½	71	.17¾	88	.22
4	.1	21	.5¼	38	. 9½	55	.13¾	72	.18	89	.22¼
5	.1¼	22	.5½	39	. 9¾	56	.14	73	.18¼	90	.22½
6	.1½	23	.5¾	40	.10	57	.14¼	74	.18½	91	.22¾
7	.1¾	24	.6	41	.10¼	58	.14½	75	.18¾	92	.23
8	.2	25	.6¼	42	.10½	59	.14¾	76	.19	93	.23¼
9	.2¼	26	.6½	43	.10¾	60	.15	77	.19¼	94	.23½
10	.2½	27	.6¾	44	.11	61	.15¼	78	.19½	96	.24
11	.2¾	28	.7	45	.11¼	62	.15½	79	.19¾	98	.24½
12	.3	29	.7¼	46	.11½	63	.15¾	80	.20	100	.25
13	.3¼	30	.7½	47	.11¾	64	.16	81	.20¼	200	.50
14	.3½	31	.7¾	48	.12	65	.16¼	82	.20½	300	.75
15	.3¾	32	.8	49	.12¼	66	.16½	83	.20¾	400	1.00
16	.4	33	.8¼	50	.12½	67	.16¾	84	.21	500	1.25
17	.4¼	34	.8½	51	.12¾	68	.17	85	.21¼	1000	2.50

At ½ Cent

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	. ½	32	.16	63	.31½
2	. 1	33	.16½	64	.32
3	. 1½	34	.17	65	.32½
4	. 2	35	.17½	66	.33
5	. 2½	36	.18	67	.33½
6	. 3	37	.18½	68	.34
7	. 3½	38	.19	69	.34½
8	. 4	39	.19½	70	.35
9	. 4½	40	.20	71	.35½
10	. 5	41	.20½	72	.36
11	. 5½	42	.21	73	.36½
12	. 6	43	.21½	74	.37
13	. 6½	44	.22	75	.37½
14	. 7	45	.22½	76	.38
15	. 7½	46	.23	78	.39
16	. 8	47	.23½	80	.40
17	. 8½	48	.24	82	.41
18	. 9	49	.24½	84	.42
19	. 9½	50	.25	86	.43
20	.10	51	.25½	88	.44
21	.10½	52	.26	90	.45
22	.11	53	.26½	92	.46
23	.11½	54	.27	94	.47
24	.12	55	.27½	96	.48
25	.12½	56	.28	98	.49
26	.13	57	.28½	100	.50
27	.13½	58	.29	200	1.
28	.14	59	.29½	300	1.50
29	.14½	60	.30	400	2.
30	.15	61	.30½	500	2.50
31	.15½	62	.31	1000	5.

At 1 Cent

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	. 1	32	.32	63	.63
2	. 2	33	.33	64	.64
3	. 3	34	.34	65	.65
4	. 4	35	.35	66	.66
5	. 5	36	.36	67	.67
6	. 6	37	.37	68	.68
7	. 7	38	.38	69	.69
8	. 8	39	.39	70	.70
9	. 9	40	.40	71	.71
10	.10	41	.41	72	.72
11	.11	42	.42	73	.73
12	.12	43	.43	74	.74
13	.13	44	.44	75	.75
14	.14	45	.45	76	.76
15	.15	46	.46	78	.78
16	.16	47	.47	80	.80
17	.17	48	.48	82	.82
18	.18	49	.49	84	.84
19	.19	50	.50	86	.86
20	.20	51	.51	88	.88
21	.21	52	.52	90	.90
22	.22	53	.53	92	.92
23	.23	54	.54	94	.94
24	.24	55	.55	96	.96
25	.25	56	.56	98	.98
26	.26	57	.57	100	1.
27	.27	58	.58	200	2.
28	.28	59	.59	300	3.
29	.29	60	.60	400	4.
30	.30	61	.61	500	5.
31	.31	62	.62	1000	10.

At 2 Cents

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	. 2	32	.64	63	1.26
2	. 4	33	.66	64	1.28
3	. 6	34	.68	65	1.30
4	. 8	35	.70	66	1.32
5	.10	36	.72	67	1.34
6	.12	37	.74	68	1.36
7	.14	38	.76	69	1.38
8	.16	39	.78	70	1.40
9	.18	40	.80	71	1.42
10	.20	41	.82	72	1.44
11	.22	42	.84	73	1.46
12	.24	43	.86	74	1.48
13	.20	44	.88	75	1.50
14	.28	45	.90	76	1.52
15	.30	46	.92	78	1.56
16	.32	47	.94	80	1.60
17	.34	48	.96	82	1.64
18	.36	49	.98	84	1.68
19	.38	50	1.	86	1.72
20	.40	51	1.02	88	1.76
21	.42	52	1.04	90	1.80
22	.44	53	1.06	92	1.84
23	.46	54	1.08	94	1.88
24	.48	55	1.10	96	1.92
25	.50	56	1.12	98	1.96
26	.52	57	1.14	100	2.
27	.54	58	1.16	200	4.
28	.56	59	1.18	300	6.
29	.58	60	1.20	400	8.
30	.60	61	1.22	500	10.
31	.62	62	1.24	1000	20.

At 5 Cents

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	. 5	32	1.60	63	3.15
2	.10	33	1.65	64	3.20
3	.15	34	1.70	65	3.25
4	.20	35	1.75	66	3.30
5	.25	36	1.80	67	3.35
6	.30	37	1.85	68	3.40
7	.35	38	1.90	69	3.45
8	.40	39	1.95	70	3.50
9	.45	40	2.	71	3.55
10	.50	41	2.05	72	3.60
11	.55	42	2.10	73	3.65
12	.60	43	2.15	74	3.70
13	.65	44	2.20	75	3.75
14	.70	45	2.25	76	3.80
15	.75	46	2.30	78	3.90
16	.80	47	2.35	80	4.
17	.85	48	2.40	82	4.10
18	.90	49	2.45	84	4.20
19	.95	50	2.50	86	4.30
20	1.	51	2.55	88	4.40
21	1.05	52	2.60	90	4.50
22	1.10	53	2.65	92	4.60
23	1.15	54	2.70	94	4.70
24	1.20	55	2.75	96	4.80
25	1.25	56	2.80	98	4.90
26	1.30	57	2.85	100	5.
27	1.35	58	2.90	125	6.25
28	1.40	59	2.95	150	7.50
29	1.45	60	3.	175	8.75
30	1.50	61	3.05	200	10.
31	1.55	62	3.10	225	11.25

At 10 Cents

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.10	32	3.20	63	6.30
2	.20	33	3.30	64	6.40
3	.30	34	3.40	65	6.50
4	.40	35	3.50	66	6.60
5	.50	36	3.60	67	6.70
6	.60	37	3.70	68	6.80
7	.70	38	3.80	69	6.90
8	.80	39	3.90	70	7.
9	.90	40	4.	71	7.10
10	1.	41	4.10	72	7.20
11	1.10	42	4.20	73	7.30
12	1.20	43	4.30	74	7.40
13	1.30	44	4.40	75	7.50
14	1.40	45	4.50	76	7.60
15	1.50	46	4.60	78	7.80
16	1.60	47	4.70	80	8.
17	1.70	48	4.80	82	8.20
18	1.80	49	4.90	84	8.40
19	1.90	50	5.	86	8.60
20	2.	51	5.10	88	8.80
21	2.10	52	5.20	90	9.
22	2.20	53	5.30	92	9.20
23	2.30	54	5.40	94	9.40
24	2.40	55	5.50	96	9.60
25	2.50	56	5.60	98	9.80
26	2.60	57	5.70	100	10.
27	2.70	58	5.80	125	12.50
28	2.80	59	5.90	150	15.
29	2.90	60	6.	175	17.50
30	3.	61	6.10	200	20.
31	3.10	62	6.20	225	22.50

At 25 Cents

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.25	32	8.	63	15.75
2	.50	33	8.25	64	16.
3	.75	34	8.50	65	16.25
4	1.	35	8.75	66	16.50
5	1.25	36	9.	67	16.75
6	1.50	37	9.25	68	17.
7	1.75	38	9.50	69	17.25
8	2.	39	9.75	70	17.50
9	2.25	40	10.	71	17.75
10	2.50	41	10.25	72	18.
11	2.75	42	10.50	73	18.25
12	3.	43	10.75	74	18.50
13	3.25	44	11.	75	18.75
14	3.50	45	11.25	76	19.
15	3.75	46	11.50	78	19.50
16	4.	47	11.75	80	20.
17	4.25	48	12.	82	20.50
18	4.50	49	12.25	84	21.
19	4.75	50	12.50	86	21.50
20	5.	51	12.75	88	22.
21	5.25	52	13.	90	22.50
22	5.50	53	13.25	92	23.
23	5.75	54	13.50	94	23.50
24	6.	55	13.75	96	24.
25	6.25	56	14.	98	24.50
26	6.50	57	14.25	100	25.
27	6.75	58	14.50	125	31.25
28	7.	59	14.75	150	37.50
29	7.25	60	15.	175	43.75
30	7.50	61	15.25	200	50.
31	7.75	62	15.50	225	56.25

At 12½ Cents, or ⅛ of a Dollar

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.12½	32	4.	63	7.87½
2	.25	33	4.12½	64	8.
3	.37½	34	4.25	65	8.12½
4	.50	35	4.37½	66	8.25
5	.62½	36	4.50	67	8.37½
6	.75	37	4.62½	68	8.50
7	.87½	38	4.75	69	8.62½
8	1.	39	4.87½	70	8.75
9	1.12½	40	5.	71	8.87½
10	1.25	41	5.12½	72	9.
11	1.37½	42	5.25	73	9.12½
12	1.50	43	5.37½	74	9.25
13	1.62½	44	5.50	75	9.37½
14	1.75	45	5.62½	76	9.50
15	1.87½	46	5.75	78	9.75
16	2.	47	5.87½	80	10.
17	2.12½	48	6.	82	10.25
18	2.25	49	6.12½	84	10.50
19	2.37½	50	6.25	86	10.75
20	2.50	51	6.37½	88	11.
21	2.62½	52	6.50	90	11.25
22	2.75	53	6.62½	92	11.50
23	2.87½	54	6.75	94	11.75
24	3.	55	6.87½	96	12.
25	3.12½	56	7.	98	12.25
26	3.25	57	7.12½	100	12.50
27	3.37½	58	7.25	125	15.62½
28	3.50	59	7.37½	150	18.75
29	3.62½	60	7.50	175	21.87½
30	3.75	61	7.62½	200	25.
31	3.87½	62	7.75	225	28.12½

At 33⅓ Cents, or ⅓ of a Dollar

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.33⅓	32	10.66⅔	63	21.
2	.66⅔	33	11.	64	21.33⅓
3	1.	34	11.33⅓	65	21.66⅔
4	1.33⅓	35	11.66⅔	66	22.
5	1.66⅔	36	12.	67	22.33⅓
6	2.	37	12.33⅓	68	22.66⅔
7	2.33⅓	38	12.66⅔	69	23.
8	2.66⅔	39	13.	70	23.33⅓
9	3.	40	13.33⅓	71	23.66⅔
10	3.33⅓	41	13.66⅔	72	24.
11	3.66⅔	42	14.	73	24.33⅓
12	4.	43	14.33⅓	74	24.66⅔
13	4.33⅓	44	14.66⅔	75	25.
14	4.66⅔	45	15.	76	25.33⅓
15	5.	46	15.33⅓	78	26.
16	5.33⅓	47	15.66⅔	80	26.66⅔
17	5.66⅔	48	16.	82	27.33⅓
18	6.	49	16.33⅓	84	28.
19	6.33⅓	50	16.66⅔	86	28.66⅔
20	6.66⅔	51	17.	88	29.33⅓
21	7.	52	17.33⅓	90	30.
22	7.33⅓	53	17.66⅔	92	30.66⅔
23	7.66⅔	54	18.	94	31.33⅓
24	8.	55	18.33⅓	96	32.
25	8.33⅓	56	18.66⅔	98	32.66⅔
26	8.66⅔	57	19.	100	33.33⅓
27	9.	58	19.33⅓	125	41.66⅔
28	9.33⅓	59	19.66⅔	150	50.
29	9.66⅔	60	20.	175	58.33⅓
30	10.	61	20.33⅓	200	66.66⅔
31	10.33⅓	62	20.66⅔	225	75.

At 43¾ Cents, or $\frac{7}{16}$ of a Dollar

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.43¾	32	14.	63	27.56¼
2	.87½	33	14.43¾	64	28.
3	1.31¼	34	14.87½	65	28.43¾
4	1.75	35	15.31¼	66	28.87½
5	2.18¾	36	15.75	67	29.31¼
6	2.62½	37	16.18¾	68	29.75
7	3.06¼	38	16.62½	69	30.18¾
8	3.50	39	17.06¼	70	30.62½
9	3.93¾	40	17.50	71	31.06¼
10	4.37½	41	17.93¾	72	31.50
11	4.81¼	42	18.37½	73	31.93¾
12	5.25	43	18.81¼	74	32.37½
13	5.68¾	44	19.25	75	32.81¼
14	6.12½	45	19.68¾	76	33.25
15	6.56¼	46	20.12½	78	34.12½
16	7.	47	20.56¼	80	35.
17	7.43¾	48	21.	82	35.87½
18	7.87½	49	21.43¾	84	36.75
19	8.31¼	50	21.87½	86	37.62½
20	8.75	51	22.31¼	88	38.50
21	9.18¾	52	22.75	90	39.37½
22	9.62½	53	23.18¾	92	40.25
23	10.06¼	54	23.62½	94	41.12½
24	10.50	55	24.06¼	96	42.
25	10.93¾	56	24.50	98	42.87½
26	11.37½	57	24.93¾	100	43.75
27	11.81¼	58	25.37½	125	54.68¾
28	12.25	59	25.81¼	150	65.62½
29	12.68¾	60	26.25	175	76.56¼
30	13.12½	61	26.68¾	200	87.50
31	13.65¼	62	27.12½	225	98.43¾

At 56¼ Cents, or $\frac{9}{16}$ of a Dollar

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.56¼	32	18.	63	35.43¾
2	1.12½	33	18.56¼	64	36.
3	1.68¾	34	19.12½	65	36.56¼
4	2.25	35	19.68¾	66	37.12½
5	2.81¼	36	20.25	67	37.68¾
6	3.37½	37	20.81¼	68	38.25
7	3.93¾	38	21.37½	69	38.81¼
8	4.50	39	21.93¾	70	39.37½
9	5.06¼	40	22.50	71	39.93¾
10	5.62½	41	23.06¼	72	40.50
11	6.18¾	42	23.62½	73	41.06¼
12	6.75	43	24.18¾	74	41.62½
13	7.31¼	44	24.75	75	42.18¾
14	7.87½	45	25.31¼	76	42.75
15	8.43¾	46	25.87½	78	43.87½
16	9.	47	26.43¾	80	45.
17	9.56¼	48	27.	82	46.12½
18	10.12½	49	27.56¼	84	47.25
19	10.68¾	50	28.12½	86	48.37½
20	11.25	51	28.68¾	88	49.50
21	11.81¼	52	29.25	90	50.62½
22	12.37½	53	29.81¼	92	51.75
23	12.93¾	54	30.37½	94	52.87½
24	13.50	55	30.93¾	96	54.
25	14.06¼	56	31.50	98	55.12½
26	14.62½	57	32.06¼	100	56.25
27	15.18¾	58	32.62½	125	70.31¼
28	15.75	59	33.18¾	150	84.37½
29	16.31¼	60	33.75	175	98.43¾
30	16.87½	61	34.31¼	200	112.50
31	17.43¾	62	34.87½	225	126.56¼

At 50 Cents

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.50	32	16.	63	31.50
2	1.	33	16.50	64	32.
3	1.50	34	17.	65	32.50
4	2.	35	17.50	66	33.
5	2.50	36	18.	67	33.50
6	3.	37	18.50	68	34.
7	3.50	38	19.	69	34.50
8	4.	39	19.50	70	35.
9	4.50	40	20.	71	35.50
10	5.	41	20.50	72	36.
11	5.50	42	21.	73	36.50
12	6.	43	21.50	74	37.
13	6.50	44	22.	75	37.50
14	7.	45	22.50	76	38.
15	7.50	46	23.	78	39.
16	8.	47	23.50	80	40.
17	8.50	48	24.	82	41.
18	9.	49	24.50	84	42.
19	9.50	50	25.	86	43.
20	10.	51	25.50	88	44.
21	10.50	52	26.	90	45.
22	11.	53	26.50	92	46.
23	11.50	54	27.	94	47.
24	12.	55	27.50	96	48.
25	12.50	56	28.	98	49.
26	13.	57	28.50	100	50.
27	13.50	58	29.	125	62.50
28	14.	59	29.50	150	75.
29	14.50	60	30.	175	87.50
30	15.	61	30.50	200	100.
31	15.50	62	31.	225	112.50

At 87½ Cents, or ⅞ of a Dollar

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	.87½	32	28.	63	55.12½
2	1.75	33	28.87½	64	56.
3	2.62½	34	29.75	65	56.87½
4	3.50	35	30.62½	66	57.75
5	4.37½	36	31.50	67	58.62½
6	5.25	37	32.37½	68	59.50
7	6.12½	38	33.25	69	60.37½
8	7.	39	34.12½	70	61.52
9	7.87½	40	35.	71	62.12½
10	8.75	41	35.87½	72	63.
11	9.62½	42	36.75	73	63.87½
12	10.50	43	37.62½	74	64.75
13	11.37½	44	38.50	75	65.62½
14	12.25	45	39.37½	76	66.50
15	13.12½	46	40.25	78	68.25
16	14.	47	41.12½	80	70.
17	14.87½	48	42.	82	71.75
18	15.75	49	42.87½	84	73.50
19	16.62½	50	43.75	86	75.25
20	17.50	51	44.62½	88	77.
21	18.37½	52	45.50	90	78.75
22	19.25	53	46.37½	92	80.50
23	20.12½	54	47.25	94	82.25
24	21.	55	48.12½	96	84.
25	21.87½	56	49.	98	85.75
26	22.75	57	49.87½	100	87.50
27	23.62½	58	50.75	125	109.37½
28	24.50	59	51.62½	150	131.25
29	25.37½	60	52.50	175	153.12½
30	26.25	61	53.37½	200	175.
31	27.12½	62	54.25	225	196.87½

At $1.25

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	1.25	36	45.	71	88.75
2	2.50	37	46.25	72	90.
3	3.75	38	47.50	73	91.25
4	5.	39	48.75	74	92.50
5	6.25	40	50.	75	93.75
6	7.50	41	51.25	76	95.
7	8.75	42	52.50	77	96.25
8	10.	43	53.75	78	97.50
9	11.25	44	55.	79	98.75
10	12.50	45	56.25	80	100.
11	13.75	46	57.50	81	101.25
12	15.	47	58.75	82	102.50
13	16.25	48	60.	83	103.75
14	17.50	49	61.25	84	105.
15	18.75	50	62.50	85	106.25
16	20.	51	63.75	86	107.50
17	21.25	52	65.	87	108.75
18	22.50	53	66.25	88	110.
19	23.75	54	67.50	89	111.25
20	25.	55	68.75	90	112.50
21	26.25	56	70.	91	113.75
22	27.50	57	71.25	92	115.
23	28.75	58	72.50	93	116.25
24	30.	59	73.75	94	117.50
25	31.25	60	75.	95	118.75
26	32.50	61	76.25	96	120.
27	33.75	62	77.50	97	121.25
28	35.	63	78.75	98	122.50
29	36.25	64	80.	99	123.75
30	37.50	65	81.25	100	125.
31	38.75	66	82.50	125	156.25
32	40.	67	83.75	150	187.50
33	41.25	68	85.	175	218.75
34	42.50	69	86.25	200	250.
35	43.75	70	87.50	225	281.25

At $1.50

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	1.50	36	54.	71	106.50
2	3.	37	55.50	72	108.
3	4.50	38	57.	73	109.50
4	6.	39	58.50	74	111.
5	7.50	40	60.	75	112.50
6	9.	41	61.50	76	114.
7	10.50	42	63.	77	115.50
8	12.	43	64.50	78	117.
9	13.50	44	66.	79	118.50
10	15.	45	67.50	80	120.
11	16.50	46	69.	81	121.50
12	18.	47	70.50	82	123.
13	19.50	48	72.	83	124.50
14	21.	49	73.50	84	126.
15	22.50	50	75.	85	127.50
16	24.	51	76.50	86	129.
17	25.50	52	78.	87	130.50
18	27.	53	79.50	88	132.
19	28.50	54	81.	89	133.50
20	30.	55	82.50	90	135.
21	31.50	56	84.	91	136.50
22	33.	57	85.50	92	138.
23	34.50	58	87.	93	139.50
24	36.	59	88.50	94	141.
25	37.50	60	90.	95	142.50
26	39.	61	91.50	96	144.
27	40.50	62	93.	97	145.50
28	42.	63	94.50	98	147.
29	43.50	64	96.	99	148.50
30	45.	65	97.50	100	150.
31	46.50	66	99.	125	187.50
32	48.	67	100.50	150	225.
33	49.50	68	102.	175	262.50
34	51.	69	103.50	220	300.
35	52.50	70	105.	250	337.50

At $1.75

No.	$ Cts.	No.	$ Cts.	No.	$ Cts.	No.	$ Cts.	No.	$ Cts.	No.	$ Cts.
1	1.75	18	31.50	35	61.25	52	91.	69	120.75	86	150.50
2	3.50	19	33.25	36	63.	53	92.75	70	122.50	87	152.25
3	5.25	20	35.	37	64.75	54	94.50	71	124.25	88	154.
4	7.	21	36.75	38	66.50	55	96.25	72	126.	89	155.75
5	8.75	22	38.50	39	68.25	56	98.	73	127.75	90	157.50
6	10.50	23	40.25	40	70.	57	99.75	74	129.50	91	159.25
7	12.25	24	42.	41	71.75	58	101.50	75	131.25	92	161.
8	14.	25	43.75	42	73.50	59	103.25	76	133.	93	162.75
9	15.75	26	45.50	43	75.25	60	105.	77	134.75	94	164.50
10	17.50	27	47.25	44	77.	61	106.75	78	136.50	96	168.
11	19.25	28	49.	45	78.75	62	108.50	79	138.25	98	171.50
12	21.	29	50.75	46	80.50	63	110.25	80	140.	100	175.
13	22.75	30	52.50	47	82.25	64	112.	81	141.75	125	218.75
14	24.50	31	54.25	48	84.	65	113.75	82	143.50	150	262.50
15	26.25	32	56.	49	85.75	66	115.50	83	145.25	175	306.25
16	28.	33	57.75	50	87.50	67	117.25	84	147.	200	350.
17	29.75	34	59.50	51	89.25	68	119.	85	148.75	225	393.75

RATE OF WAGES, FROM $1 TO $21 PER WEEK

Days	50 Cts.	62½ Cts.	75 Cts.	87½ Cts.
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	. 2	. 2½	. 3	. 3½
½	. 4	. 5¼	. 6¼	. 7¼
¾	. 6¼	. 7¾	. 9¼	.10¾
1	. 8¼	.10½	.12½	.14½
1¼	.10½	.13	.15½	.18¼
1½	.12½	.15½	.18¾	.22
1¾	.14½	.18	.21¾	.25½
2	.16½	.20¾	.25	.29
2¼	.18¾	.23½	.28	.32¾
2½	.20¾	.26	.31¼	.36½
2¾	.23	.28¾	.34¼	.40
3	.25	.31¼	.37½	.43¾
3¼	.27	.33¾	.40½	.47¼
3½	.29	.36¼	.43	.51
3¾	.31¼	.39	.46¾	.54½
4	.33¼	.41½	.50	.58¼
4¼	.35¼	.44	.53	.62

Days	50 Cts.	62½ Cts.	75 Cts.	87½ Cts
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
4½	.37½	.46¾	.56¼	.65½
4¾	.39½	.49¼	.59¼	.69½
5	.41½	.52	.62½	.73
5¼	.43¾	.54½	.65½	.76¼
5½	.45¾	.57¼	.68¾	.80
5¾	.47¾	.59¾	.71¾	.83¾
6	.50	.62½	.75	.87½
7	.58¼	.72¾	.87½	1.02
8	.66½	.83¼	1.	1.16½
9	.75	.93¾	1.12½	1.31¼
10	.83¼	1.04	1.25	1.45¾
11	.91¾	1.14¼	1.37½	1.60¼
12	1.	1.25	1.50	1.75
18	1.50	1.87½	2.25	2.62½
24	2.	2.50	3.	3.50
26	2.16½	2.71	3.25	3.79

Days	$1	$1.12½	$1.25	$1.37½
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	. 4	. 4¾	. 5¼	. 5¾
½	. 8½	. 9¼	.10½	.11½
¾	.12½	.14	.15½	.17¼
1	.16½	.18¾	.20¾	.23
1¼	.20¾	.23½	.26	.28½
1½	.25	.28	.31¼	.34¼
1¾	.29	.32¾	.36½	.40
2	.33¼	.37½	.41½	.45¾
2¼	.37½	.42¼	.46¾	.51½
2½	.41½	.46¾	.52	.57¼
2¾	.45¾	.51½	.57¼	.63
3	.50	.56¼	.62½	.68¾
3¼	.54	.61	.67¾	.74½
3½	.58¼	.65½	.72¾	.80¼
3¾	.62½	.70¼	.78	.86
4	.66½	.75	.83¼	.91½
4¼	.70¾	.79¾	.88½	.97¼
4½	.75	.84¼	.93¾	1.03
4¾	.79	.89	.98¾	1.08¾
5	.83¼	.93¾	1.04	1.14½
5¼	.87½	.98¼	1.09¼	1.20¼
5½	.91¾	1.03	1.14½	1.26
5¾	.95¾	1.07¾	1.19¾	1.31¾
6	1.	1.12½	1.25	1.37½
7	1.16½	1.31¼	1.45¾	1.60½
8	1.33¼	1.50	1.66½	1.83¼
9	1.50	1.68¾	1.87½	2.06¼
10	1.66½	1.87½	2.08¼	2.29
11	1.83¼	2.06¼	2.29	2.52
12	2.	2.25	2.50	2.75
18	3.	3.37½	3.75	4.12½
24	4.	4.50	5.	5.50
26	4.33¼	4.87½	5.42	5.96

Days	$1.50	$1.62½	$1.75	$1.87½
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	. 6¼	. 6¾	. 7¼	. 7¾
½	.12½	.13½	.14½	.15½
¾	.18¾	.20¼	.21¾	.23½
1	.25	.27	.29	.31¼
1¼	.31¼	.33¾	.36¼	.39
1½	.37½	.40½	.43¾	.46¾
1¾	.43¾	.47¼	.51	.54¾
2	.50	.54	.58¼	.62½
2¼	.56¼	.61	.65½	.70¼
2½	.62½	.67¾	.73	.78
2¾	.68¾	.74½	.80¼	.86
3	.75	.81¼	.87½	.93¾
3¼	.81¼	.88	.94¾	1.01½
3½	.87½	.94¾	1.02	1.09½
3¾	.93¾	1.01½	1.09¼	1.17¼
4	1.	1.08¼	1.16½	1.25
4¼	1.06¼	1.15	1.23¾	1.32¾
4½	1.12½	1.21¾	1.31¼	1.40½
4¾	1.18¾	1.28½	1.38½	1.48¼
5	1.25	1.35¼	1.45¾	1.56¼
5¼	1.31¼	1.42¼	1.53¼	1.64
5½	1.37½	1.49	1.60½	1.71¾
5¾	1.43¾	1.55¾	1.67¾	1.79¾
6	1.50	1.62½	1.75	1.87½
7	1.75	1.89½	2.04	2.18¾
8	2.	2.16½	2.33¼	2.50
9	2.25	2.43¾	2.62½	2.81¼
10	2.50	2.70¾	2.91½	3.12½
11	2.75	2.98	3.20¾	3.43¾
12	3.	3.25	3.50	3.75
18	4.50	4.87½	5.25	5.62½
24	6.	6.50	7.	7.50
26	6.50	7.04	7.58¼	8.12½

Days	$2	$2.50	$3	$3.50
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	. 8¼	.10½	.12½	.14½
½	.16½	.20¾	.25	.29
¾	.25	.31¼	.37½	.43¾
1	.33¼	.41½	.50	.58¼
1¼	.41½	.52	.62½	.72¾
1½	.50	.62½	.75	.87½
1¾	.58¼	.73	.87½	1.02
2	.66½	.83¼	1.	1.16½
2¼	.75	.93¾	1.12½	1.31¼
2½	.83¼	1.04	1.25	1.45¾
2¾	.91½	1.14½	1.37½	1.60¼
3	1.	1.25	1.50	1.75
3¼	1.08¼	1.35½	1.62½	1.89½
3½	1.16½	1.46	1.75	2.04
3¾	1.25	1.56¼	1.87½	2.18¾
4	1.33¼	1.66½	2.	2.33¼
4¼	1.41½	1.77	2.12½	2.47¾
4½	1.50	1.87½	2.25	2.62½
4¾	1.58¼	1.97¾	2.37½	2.77
5	1.66½	2.08¼	2.50	2.91½
5½	1.83¼	2.29	2.75	3.20¾
6	2.	2.50	3.	3.50
7	2.33¼	2.91½	3.50	4.08¼
8	2.66½	3.33¼	4.	4.66½
9	3.	3.75	4.50	5.25
10	3.33¼	4.16¾	5.	5.83¼
11	3.66½	4.58¼	5.50	6.41½
12	4.	5.	6.	7.
18	6.	7.50	9.	10.50
24	8.	10.	12.	14.
26	8.66½	10.83¼	13.	15.16½

Days	$4	$4.50	$5	$5.50
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	.16½	.18¾	.20¾	.23
½	.33¼	.37½	.41½	.45¾
¾	.50	.56¼	.62½	.68¾
1	.66½	.75	.83¼	.91½
1¼	.83¼	.93¾	1.04	1.14½
1½	1.	1.12½	1.25	1.37½
1¾	1.16½	1.31¼	1.45¾	1.60½
2	1.33¼	1.50	1.66½	1.83¼
2¼	1.50	1.68¾	1.87½	2.06¼
2½	1.66½	1.87½	2.08¼	2.29
2¾	1.83¼	2.06¼	2.29	2.52
3	2.	2.25	2.50	2.75
3¼	2.16½	2.43¾	2.70¾	2.98
3½	2.33¼	2.62½	2.91¾	3.20¾
3¾	2.50	2.81¼	3.12½	3.43¾
4	2.66½	3.	3.33¼	3.66½
4¼	2.83¼	3.18¾	3.54¼	3.89½
4½	3.	3.37½	3.75	4.12½
4¾	3.16½	3.56¼	3.95¾	4.35½
5	3.33¼	3.75	4.16½	4.58¼
5½	3.66½	4.12½	4.58¼	5.04
6	4.	4.50	5.	5.50
7	4.66½	5.25	5.83¼	6.41½
8	5.33¼	6.	6.66½	7.33¼
9	6.	6.75	7.50	8.25
10	6.66½	7.50	8.33¼	9.16½
11	7.33¼	8.25	9.16½	10.08¼
12	8.	9.	10.	11.
18	12.	13.50	15.	16.50
24	16.	18.	20.	22.
26	17.33¼	19.50	21.66½	23.83¼

Days	$6	$7	$8	$9
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	.25	.29	.33¼	.37½
½	.50	.58¼	.66½	.75
¾	.75	.87½	1.	1.12½
1	1.	1.16½	1.33¼	1.50
1¼	1.25	1.45¾	1.66½	1.87½
1½	1.50	1.75	2.	2.25
1¾	1.75	2.04	2.33¼	2.62½
2	2.	2.33¼	2.66½	3.
2¼	2.25	2.62½	3.	3.37½
2½	2.50	2.91½	3.33¼	3.75
2¾	2.75	3.20¾	3.66½	4.12½
3	3.	3.50	4.	4.50
3¼	3.25	3.79	4.33¼	4.87½
3½	3.50	4.08¼	4.66½	5.25
3¾	3.75	4.37½	5.	5.62½
4	4.	4.66½	5.33¼	6.
4¼	4.25	4.95¾	5.66½	6.37½
4½	4.50	5.25	6.	6.75
4¾	4.75	5.54	6.33¼	7.12½
5	5.	5.83¼	6.66½	7.50
5½	5.50	6.41½	7.33¼	8.25
6	6.	7.	8.	9.
7	7.	8.16½	9.33¼	10.50
8	8.	9.33¼	10.66½	12.
9	9.	10.50	12.	13.50
10	10.	11.66½	13.33¼	15.
11	11.	12.83¼	14.66½	16.50
12	12.	14.	16.	18.
18	18.	21.	24.	27.
24	24.	28.	32.	36.
26	26.	30.33¼	34.66½	39.

Days	$10	$11	$12	$13
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	.41⅔	.46	.50	.54
½	.83½	.91⅔	1.	1.08½
¾	1.25	1.37½	1.50	1.62½
1	1.66⅔	1.83½	2.	2.16⅔
1¼	2.08½	2.29	2.50	2.71
1½	2.50	2.75	3.	3.25
1¾	2.91⅔	3.21	3.50	3.79
2	3.33½	3.66⅔	4.	4.33½
2¼	3.75	4.12½	4.50	4.87½
2½	4.16⅔	4.58½	5.	5.41⅔
2¾	4.58½	5.04	5.50	5.96
3	5.	5.50	6.	6.50
3¼	5.41⅔	5.96	6.50	7.04
3½	5.83½	6.41⅔	7.	7.58½
3¾	6.25	6.87½	7.50	8.12½
4	6.66⅔	7.33½	8.	8.66⅔
4¼	7.08½	7.79	8.50	9.21
4½	7.50	8.25	9.	9.75
4¾	7.91⅔	8.71	9.50	10.29
5	8.33½	9.16⅔	10.	10.83½
5½	9.16⅔	10.08½	11.	11.91⅔
6	10.	11.	12.	13.
7	11.66⅔	12.83½	14.	15.16⅔
8	13.33½	14.66⅔	16.	17.33½
9	15.	16.50	18.	19.50
10	16.66⅔	18.33½	20.	21.66⅔
11	18.33½	20.16⅔	22.	23.83½
12	20.	22.	24.	26.
18	30.	33.	36.	39.
24	40.	44.	48.	52.
26	43.33½	47.66⅔	52.	56.33½

Days	$14	$15	$16	$17
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	.58½	.62½	.66⅔	.71
½	1.16⅔	1.25	1.33⅓	1.41⅔
¾	1.75	1.87½	2.	2.12½
1	2.33⅓	2.50	2.66⅔	2.83½
1¼	2.91⅔	3.12½	3.33½	3.54
1½	3.50	3.75	4.	4.25
1¾	4.08½	4.37½	4.66⅔	4.96
2	4.66⅔	5.	5.33½	5.66⅔
2¼	5.25	5.62½	6.	6.37½
2½	5.83½	6.25	6.66⅔	7.08½
2¾	6.41⅔	6.87½	7.33½	7.79
3	7.	7.50	8.	8.50
3¼	7.58½	8.12½	8.66⅔	9.21
3½	8.16⅔	8.75	9.33½	9.91⅔
3¾	8.75	9.37½	10.	10.62½
4	9.33½	10.	10.66⅔	11.33½
4¼	9.91⅔	10.62½	11.33½	12.04
4½	10.50	11.25	12.	12.75
4¾	11.08½	11.87½	12.66⅔	13.46
5	11.66⅔	12.50	13.33½	14.16⅔
5½	12.83½	13.75	14.66⅔	15.58½
6	14.	15.	16.	17.
7	16.33½	17.50	18.66⅔	19.83½
8	18.66⅔	20.	21.33½	22.66⅔
9	21.	22.50	24.	25.50
10	23.33½	25.	26.66⅔	28.33½
11	25.66⅔	27.50	29.33½	31.16⅔
12	28.	30.	32.	34.
18	42.	45.	48.	51.
24	56.	60.	64.	68.
26	60.66½	65.	69.33½	73.66⅔

Days	$18	$19	$20	$21
	$ Cts.	$ Cts.	$ Cts.	$ Cts.
¼	.75	.79	.83½	.87½
½	1.50	1.58½	1.66¾	1.75
¾	2.25	2.37½	2.50	2.62½
1	3.	3.16⅔	3.33½	3.50
1¼	3.75	3.96	4.16¾	4.37½
1½	4.50	4.75	5.	5.25
1¾	5.25	5.54	5.83½	6.12½
2	6.	6.33½	6.66¾	7.
2¼	6.75	7.12½	7.50	7.87½
2½	7.50	7.91⅔	8.33½	8.75
2¾	8.25	8.71	9.16¾	9.62½
3	9.	9.50	10.	10.50
3¼	9.75	10.29	10.83½	11.37½
3½	10.50	11.08½	11.66¾	12.25
3¾	11.25	11.87½	12.50	13.12½
4	12.	12.66⅔	13.33½	14.
4¼	12.75	13.46	14.16¾	14.87½
4½	13.50	14.25	15.	15.75
4¾	14.25	15.04	15.83½	16.62½
5	15.	15.83½	16.66¾	17.50
5½	16.50	17.41⅔	18.33½	19.25
6	18.	19.	20.	21.
7	21.	22.16⅔	23.33½	24.50
8	24.	25.33½	26.66¾	28.
9	27.	28.50	30.	31.50
10	30.	31.66⅔	33.33½	35.
11	33.	34.83½	36.66¾	38.
12	36.	38.	40.	42.
18	54.	57.	60.	63.
24	72.	76.	80.	84.
26	78.	82.33½	86.66¾	91.

RATE OF BOARD BY THE WEEK

Time	Rate	Rate	Rate	Rate	Rate
W. D.	$2.00	$2.25	$2.50	$3.00	$3.50
1	.29	.32	.36	.43	.50
2	.57	.64	.71	.86	1.
3	.86	.96	1.07	1.29	1.50
4	1.14	1.26	1.43	1.71	2.
5	1.43	1.61	1.79	2.14	2.50
6	1.71	1.93	2.14	2.57	3.
1.1	2.29	2.57	2.86	3.43	4.
1.2	2.57	2.89	3.21	3.86	4.50
1.3	2.86	3.21	3.57	4.29	5.
1.4	3.14	3.54	3.93	4.71	5.50
1.5	3.43	3.86	4.29	5.14	6.
1.6	3.71	4.18	4.64	5.57	6.50
2.	4.	4.50	5.	6.	7.
2.1	4.29	4.82	5.36	6.43	7.50
2.2	4.57	5.14	5.71	6.86	8.
2.3	4.86	5.46	6.07	7.29	8.50
2.4	5.14	5.79	6.43	7.71	9.
2.5	5.43	6.11	6.79	8.14	9.50
2.6	5.71	6.43	7.14	8.57	10.
3.	6.	6.75	7.50	9.	10.50
3.1	6.29	7.07	7.86	9.43	11.
3.2	6.57	7.39	8.21	9.86	11.50
3.3	6.86	7.71	8.57	10.29	12.
3.4	7.14	8.04	8.93	10.71	12.50
3.5	7.43	8.36	9.29	11.14	13.
3.6	7.71	8.68	9.64	11.57	13.50
4.	8.	9.	10.	12.	14.

Time	Rate	Rate	Rate	Rate	Rate
W. D.	$4.00	$4.50	$5.00	$5.50	$6.00
1	.57	.64	.71	.79	.86
2	1.14	1.29	1.43	1.57	1.71
3	1.71	1.93	2.14	2.36	2.57
4	2.29	2.57	2.86	3.14	3.43
5	2.86	3.21	3.57	3.93	4.29
6	3.48	3.86	4.29	4.71	5.14
1.1	4.57	5.14	5.71	6.29	6.86
1.2	5.14	5.79	6.43	7.07	7.71
1.3	5.71	6.43	7.14	7.86	8.57
1.4	6.29	7.07	7.86	8.64	9.43
1.5	6.86	7.71	8.57	9.43	10.29
1.6	7.43	8.36	9.29	10.21	11.14
2.	8.	9.	10.	11.	12.
2.1	8.57	9.64	10.71	11.79	12.86
2.2	9.14	10.29	11.43	12.57	13.71
2.3	9.71	10.93	12.14	13.36	14.57
2.4	10.29	11.67	12.86	14.14	15.43
2.5	10.86	12.21	13.57	14.93	16.29
2.6	11.43	12.86	14.29	15.71	17.14
3.	12.	13.50	15.	16.50	18.
3.1	12.57	14.14	15.71	17.29	18.86
3.2	13.14	14.79	16.43	18.07	19.71
3.3	13.71	15.43	17.14	18.86	20.57
3.4	14.29	16.07	17.86	19.64	21.43
3.5	14.86	16.71	18.57	20.43	22.29
3.6	15.43	17.36	19.29	21.21	23.14
4.	16.	18.	20.	22.	24.

AN OUTLINE OF PHONOGRAPHY, OR SHORTHAND

WE NEED not dwell on the value and advantages of shorthand. Every boy who learns it has a twofold advantage over those who do not, whether he goes to college or at once enters into business life. The collegian can take down a full report of his professor's lecture, while his fellow-students have only rough and often unintelligible notes.

The young man who goes to learn a business, whether mechanical or commercial, takes down in a moment instructions given, conversations, examinations, details of any machine, method of working, etc. There is no walk in life in which it does not come into play.

It looks difficult to many, but is really easy to acquire, and while, like everything else that is worth learning, constant and painstaking practice is required to render it at all serviceable, the general principles may be explained in small compass, so that the attentive student may master the system for himself. There are various systems in use—some noted for speed, others for ease of learning—but the best all-around method is probably that of Isaac Pitman, which is treated in the following pages.

THE ISAAC PITMAN ALPHABET AND OUTLINES

AS in practically all systems of shorthand at present in use, the Isaac Pitman alphabet is merely a series of lines and curves, alternately *light* and *heavy*. Thus, the *light lines,* upright, horizontal, and slanted, indicate the letters T, K, P, Ch; the *heavy lines,* upright, horizontal, and slanted, the letters D, G, B, J. The *light curves* indicate Th, S, F, Sh, M, N; the *heavy curves,* hard Th, Z, V, Zh, Ng. The matter is further simplified, when we remember that all letters classed as "explodents"—P, B, T, D, Ch, J, K, G—*are indicated by lines;* all classed as "continuants"—F, V, *Th,* Th, S, Z, Sh, Zh—are *indicated by curves,* as are also the "nasals," M, N, Ng. The "linguals," L and R, and the "coalescents," W, Y, H, are separately treated, as are also final *s* (initial, terminal, for plural terminations, etc.) and *st*. These matters will be explained in place.

The vowels and diphthongs are represented by dots, lines, and other marks, as will be subsequently explained, always being added to the "outline"—for thus the combination of signs for a word is called—after it is completed.

The names of the characters, as given in the accompanying alphabet, are used in talking or writing about them, just as are the names for the letters of the ordinary alphabet, but do not represent the sounds always attaching to them in outlines. The naming of the signs is called the "nomenclature"; and it is important always to know a sign by its name, as will soon appear as we proceed.

Remember each one of these signs is a part either of a circle, or a straight line, perpendicular, horizontal, or diagonal, as shown in the accompanying cut. Imitate the cut, as nearly as you can, in length and in depth of pressure on the heavy letters. The use of heavy letters simplifies the al-

phabet, making a few directions answer double purpose. Continue to *repeat* your copying or reading of the signs, sounds, and letters (it is best to read aloud as you



The Phonographic alphabet condensed.

write), until you can skip about, and by covering up the signs, write them from the print from memory, or covering the print, read the signs. All the *heavy* signs, perpendicular or diagonal, must be written from top to bottom; all the horizontal lines, heavy and light, from left to right.

Learn this alphabet thoroughly before you go on. If you learn it in a week, you will do as well as many of the most rapid reporters did when they began to learn. As it is all-important to thoroughly master it before you go on, take your time about it.

Above is given the Phonographic alphabet, condensed—in fact, all the consonants in the language in a "nutshell," except *ray* and *aitch*. You will find it handy for easy reference. If you have not mastered the letters as presented, by all means continue your study and practice by reading, writing, and sounding them, until you can call them one by one, not only in regular order, but by skipping, and immediately on sight.

This cut represents the *shape*, but not the relative *length*. All the letters, light and heavy, should at first be written of the same length—that is, about one-quarter of an inch long. You will notice the letters which are of the same form or direction, but which differ in depth and name, are placed opposite each other, so that you can compare the single and double letters more easily.

Supposing, now, that you have learned the single letters, we proceed to give you a few examples of joining letters. Do not take off your pen or pencil between the letters in joining them. Double straight strokes should be made the full length of two single ones, as tt, kg, etc.

The method of joining consonant strokes, straight and curved, is shown in Exercise 1. In drawing a heavy line, let it taper off gradually as it joins to a light stroke.

In like manner take some ruled paper and pen (which is better than pencil), and write Exercise 2, which you will see is a continuance of the order in Exercise 1, commencing with p, etc., joining the next

CONSONANTS

EXPLODENTS.			CONTINUANTS.		
P	\	*pee*	F	⌒	*ef*
B	\	*bee*	V	⌒	*vee*
T	|	*tee*	*TH*	(	*ith*
D	|	*dee*	TH	(	*thee*
CH	/ [down stroke]	*chay*	S	)	*es*
J	/	*jay*	Z	)	*zee*
K	—	*kay*	SH	⌒	*ish*
G	—	*gay*	ZH	⌒	*zhee*

NASALS.			LIQUIDS.		
M	⌒	*em*	L	⌒ [up stroke]	*lay*
N	⌒	*en*	R	⌒ [down stroke]	*ar*
NG	⌒	*ing*	R	⌒ [up stroke]	*ray*

COALESCENTS.			ASPIRATE.		
W	⌒ [up stroke]	*way*	H	⌒ [down stroke]	*aitch*
Y	⌒ [up stroke]	*yay*	H	⌒ [up stroke]	*aitch*

DOUBLE CONSONANTS

WH	⌒ up	*whay*	LR	⌒ down	*ler*
KW	⌒	*kway*	RCH, RJ	⌒ down	*rer*
GW	⌒	*gway*	WL	⌒ up	*wel*
MP, MB	⌒	*emp*	WHL	⌒ up	*whel*

letter on the right, until we come around to the letter from which we started. Let the first down-stroke letter come to the line, and the rest follow it. If the first is horizontal, let the *second* letter rest on the line.

If two horizontal strokes begin a word, let both rest on the line.

To render the matter simpler, a hyphen (-) is placed between the single and the double letters in this exercise, but if you are familiar with the alphabet you will not make a mistake, and try to write *three* letters instead of two.

EXERCISE TWO

dp, dt, d-ch, dg, db, dd, dj, dk,
jp, jt, j-ch, jg, jb, jd jj, jk,
kp, kt, k-ch kg, kb, kd, kj, kk,
pm, tm, ch-m, km, bm, dm, jm,
pn, tn, ch-n, kn, bn, dn, jn,
p-th, t-th, ch-th, k-th, b-th, d-th, j-th,
ps, ts, ch-s, ks, bs, ds, js.

Now let us skip a little, and write three letters together:

kmt, mnt, mlt, ltn, ntl, tln,
tkk, mkt, nkt, kpl, rnt, vnt,
snp, sh-rp, lrn, h-ng.

In reading the joined signs, commence with the letter on the left and top: p-t, b-g.

H (ay), R (ay), W (ay), and Y (ay) are all written in the same direction.

It must be remembered that, in writing shorthand, every word is spelled only as it *sounds*. Note this as we go on.

The proper place for using the two kinds of R, sh, and circle, *S*, will be fully explained later. Since their uses rank among the advanced subjects of shorthand writing, they may be properly delayed until the student has mastered the simple primary rules of the subject. The student should understand, therefore, that he must faithfully practice the exercises already given before he is ready for these subjects, or for the exercises including vowels, diphthongs, etc.

RULES ON CERTAIN LETTERS

Note carefully that Ar (r) is written downward; Ray (*r*) upward; Lay (l) upward, and commences a word; but if the vowel comes before it in the spelling, El (*l*) is written instead, and downward. The circle S (iss) may either commence, occur in the middle, or at the end of a word. It also stands for Z, except at the beginning of an outline. The words in which it happens will not be confounded, as there is but little difference in the sound. Ch (ay) is always written downward, and a little more straight up than R (ay), which is always written upward and slanting to the right. If you try it you will notice how natural it is for you to make the distinction. G (ay) and *ing* are the only letters that do not come under the rule that all the heavy letters are to be written downward, and that, of course, like all other horizontal letters, are to be written from left to right. Make your heavy signs heavy enough to show the difference between the light and heavy ones, and let them *taper* from and to a fine point gradually.

When R, L, H are to be made with *downward strokes,* they are indicated in the exercises by SMALL CAPITALS: thus, R, L, H.

DIRECTION IN MAKING STROKES

While the direction of movement in making the several strokes in shorthand may seem to the beginner a somewhat indifferent matter, so long as the proper signs are written, he must carefully observe the rules laid down, remembering that two very important considerations depend upon the proper production of the strokes:

(1) In making word outlines it is imperative that the several letter signs in each case be joined consecutively, so as to read easily and readily from left to right.

(2) Another important matter—the placing of the vowel signs—depends upon the proper production of the outlines, as will be explained in the succeeding section.

THE VOWELS AND THEIR USES

In taking up the study of the vowels, the student must understand three things: (1) The vowels are never included as parts of the outline representing a word, but are written as dots, short lines, etc., above or below, before or after, the line or curve representing the consonant with which they are immediately associated.

(2) They always represent the *sounds* rather than the *spelling* of English syllables, and, as a consequence, are not combined to form diphthongs, as in longhand spelling. The diphthongal sounds are represented by special signs, as will be explained in place.

(3) The vowel and diphthong signs represent *sounds* rather than *letters.* Hence different signs are used for *long* and *short* vowels. Also, some sounds classed as diphthongal in longhand spelling are treated as simple vowels in shorthand.

RULES FOR UPWARD OR DOWNWARD STROKES

By reference to the alphabet the student will learn that there are three simple letters, H, L, R, that may be written either up-

ward or downward. Although the rules in this matter will not be of service until a later period in the study of phonography, they will be given here for reference.

REGARDING THE ASPIRATE, H, it may be said that, when represented by one of its alphabetic characters—and not by a tick or dot, as explained later—the question of using the up-stroke or the down-stroke is decided solely by convenience in forming the outline with the subsequent strokes.

STROKE R may be written upward or downward, according to convenience, in writing and deciphering outlines. There are several rules in the matter, however, that define the best practice:

(1) R, when the *first consonant* in a word, is written downward, if preceded by a vowel; *upward,* if followed by a vowel; *downward,* when both preceded and followed by vowels.

It may be written upward, however, in "earth," "origin," and other words, where the following consonant is a down-stroke.

(2) Final R is generally written *downward,* when no vowel follows it, and *upward,* when followed by a vowel.

(3) After a straight *up-stroke* it is written upward, continuing the movement of the stroke (W, R, L).

(4) In outlines of three or more strokes, final R is generally written upward.

INITIAL L is generally written *upward,* except when followed by a horizontal consonant, K, G, M, MP, N, NG, being then written *downward.*

FINAL L is generally written *upward,* but, when ending a word (no vowel following) after F, V, KW, SK, R, W, Y, H, it is written *downward.*

THE LONG VOWELS

The first set of vowels to be taken up by the student are the long vowels, which represent the sounds of *ah, ay, ee, aw, oh, oo.* Remembering that these signs *always represent sounds,* we may combine them to form the following model sentence, which should be carefully memorized:

P*a* m*ay* b*e* th*ough*t s*o* p*oo*r.

(1) The first three in this series are represented by a heavy dot (•), the second three by a short heavy dash ( ).

(2) The sound represented in each case is determined by the position of the *dot* or *dash* with regard to the *line* or *curve* representing the consonant immediately following or preceding. The *ah* dot is placed at the point where the stroke *begins,* which varies, of course, as the stroke is *from below, upward,* or *from above, downward.* The *ay* dot is placed at the *middle* of the stroke. The *ee* dot is placed at the point where the stroke *ends.* Similarly, the *aw* dash stands at the *beginning* of the stroke; the *oh* dash, at the *middle;* the *oo* dash, at the *end.* Accordingly, *ah* and *aw* are called *first-place vowels; ay* and *oh* are called *second-place vowels; ee* and *oo* are called *third-place vowels.*

(3) If the vowel sound *precedes* the consonant, it is written *to the left* of an upright or inclined *line* or *curve,* or *above* the horizontal *line* or *curve.* If it follows the consonant, it is written *to the right* of an upright or inclined *line* or *curve,* or *below* a horizontal *line* or *curve.* Thus: the word "ape" is written with the P (*pee*) line, with the *dot* in the *second position* to the *left;* the word "pay" with the same line with the dot in *second position* to the *right.* Also, the word "own" is written with the horizontal N (*en*) curve with the *dash* in *second position above;* the word "no" with the same curve, with the *dash* in *second position below.*

If you commence making the letters from the top down, you begin to place the vowels from the top; if the letter is slanting and upward, you reckon the positions from the bottom, or where you commenced.

Every stroke vowel sign must be written at right angles to the consonant line or curve to which it belongs.

The consonant line or curve must be made first, and vowels put in afterward.

Exercise 3 illustrates these rules, as is shown by the key that follows.

KEY TO EXERCISE THREE

The outlines of this exercise are explained by reference to the following list of words, which are arranged in lines precisely as in the exercise.

LINE 1.—Palm, balm, calm, laugh.
(Of course, *l* is omitted in the outlines. "Laugh" is supposed to be pronounced *lahf.*)

LINE 2.—DARE, page, MARE, rake, lame, dame.

LINE 3.—Theme, PEER, female, peep, keep, weep.

LINE 4.—FALL, bought, TALL, YAWL, cawed; also, maul.

LINE 5.—Pole, comb, coach, roar, cocoa, poach.

LINE 6.—Boot, boom, tooth, food, rude, cool, fool.

In like manner, read aloud and write outlines for the following:

EXERCISE FOUR

Ape, ope, pa, paw, ate, ought or aught, oat, taw, to or toe, too, age, jay, jaw, Joe, Jew, ache, oak, key, caw, coo, be or bee, bay, bow or beau, each, chaw, chew, me, ma, maw, mow, own, oath, ace, ail or ale, all, lo, lieu, foe, she, Shae, shoe, eve, we, way, woe, woo, ye, yea, you.

Beet, became, bail, oatmeal, Paul, game, fame, boat, caught, pool, teeth, bait, cake, goal, shame, shave, room, ball, tool, deal, delay, depot, potato, make, thaw, bathe, wreath, wreathe, zeal, leap, feed, deem, Hawk, shawl (sh and l upward), shoal, wade, rule, read, haughty, poor, cheap, kneel.

Study the *power* of each vowel sign, by reference to the word underneath it, until you can detect the long vowels in any other word you may read. The exercise will improve your pronunciation of words. Then pick out all the words you can in this reading matter which contain one or more long vowel sounds, and if they have no sound different from those in the words under the above scale, write them on paper, first the English word, and under it the phonographic consonant outline, with the vowel properly placed.

WORD SIGNS

At this point we may introduce another feature of shorthand writing, which the student should understand before proceding further. It is regarding the so-called "word signs," commonly used, whereby certain familiar short words are expressed by their characteristic consonants, instead of by phonetic outlines. Many of these letter-words are written in the second position, or *on the line*, but others, above the line (first position) or below the line (third position). Where these signs are written in the *first* or *third* positions they are indicated in the exercise keys by those numbers in parentheses; thus (1) and (3).

In the terminology of shorthand, the words that are thus expressed by characteristic letters are called GRAMMALOGUES, while the shorthand letters representing them are called LOGOGRAMS.

A number of common LOGOGRAMS are given in Exercise 3A, their longhand equivalents being appended.

KEY TO EXERCISE THREE(A)

Be, do, they (or them), the, we, give (or given), all (1), he, who, it, him (or may), which, go (1), have, was.

It is well to understand this matter at the start, in order to avoid the confusion incident on attempting to write outlines for words that are commonly represented by *logograms*. In studying the above exercise the student should carefully compare each sign with the alphabet already given, and learn what letters properly stand for the words.

THE SHORT VOWELS

The short vowel sounds are treated in shorthand in the same general fashion as the long vowels, already noticed, both as to signs and positions in the outlines. Furthermore, they correspond to the long vowels in representing the sounds of similar vowels in longhand writing. They are as follows: *a*, as in "hat"; *e*, as in "het"; *i*, as in "hit"; *o*, as in "hot"; *u*, as in "hut"; *oo* (or *u*), as in "hood." In speaking, they are called respectively, *at, et, it, ot, ut, o͝ot*.

The short vowels may be learned in the order of their positions on the consonant signs by memorizing the following sentence:

That pen is not much good.

In writing, the short vowels are represented by *light dots* and *light dashes* in the proper positions. Thus, short *a* is a light dot in the first place; short *e*, a light dot in second place; short *i*, a light dot in the third place; short *o*, a light dash in the first place; short *u*, a light dash in the second place; short *oo* (as in "good," "hood," "wood"), a light dash in the third place.

As regards place and position, the same rules hold for both long and short vowels, particularly when, as is most commonly the case, one of the short vowels *precedes* a single consonant sound, as in at, add, am, an, ebb, err, it, ill, egg, odd, off, or, up, us, etc. In order, however, to prevent the uncertainty that will frequently occur regarding a *light* or a *heavy* dot or dash, certain rules of position are adopted for short vowels in outlines of more than one consonant sound.

(1) *First* position vowels, *long* or *short*, are written after the *first* consonant.

(2) *Second* position vowels, if *long*, are written after the *first* consonant; if *short*, before the *second* consonant.

(3) *Third* position vowels, *long* or *short*, are written before the *second* consonant.

These rules should be carefully memorized and observed in practicing and writing. Exercises 5 and 6 exhibit most of the peculiarities that the student needs to understand. By carefully studying them with the keys, with reference to these rules, the matter will soon become clear.

Exercise 5A gives another series of word-signs (*logograms*), which the student should carefully note in passing, and eventually memorize.

KEY TO EXERCISE FIVE

Line 1.—Rag, tap, car, rap, Pat, tad.
Line 2.—Get, leg, wreck, peck, deck, HECK.
Line 3.—Pip, kid, fib, bit, jim, pill, FILL.
Line 4.—Rob, lock, botch, notch, fop, chop.
Line 5.—Thumb, numb, jug, Dutch, gum, HUG.
Line 6.—Book, look, cook, push, shook, HOOK.

KEY TO EXERCISE FIVE(A)

Had (1), can (1), come, if, think, shall, me or my (1), in or any (1), or (1), are, so or us, should, a or an (1), of, and (1), to, but, thing, on (1), wish (3).

In like manner write, and read aloud as you do so, the following words:

EXERCISE SIX

Pick, pack, peachy, poach, putty, tick, tack, tuck, took, touch, tip, top, tug, chick, check, cup, cage, catch, cud, bit, biddy, budge, back, jot, jet, map, Mattie, muddy, among, nothing, ship, shape, shop, ask, bet, dimity, bush, merry, sham, shell (*sh* and *l* upward), Ned, bat, caddy, carriage, copy, gem, natty, HOCK, ship, ARM, fish (*sh* upward), knell, red, ARK, FAR.

THE DIPHTHONGS

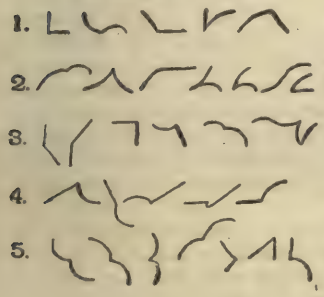
In addition to the signs for the long and short vowel sounds already given, there are five others classed as diphthongs, although, like several of the long vowel sounds, they are not all the same sounds as are so represented in English longhand writing. Thus, we have in this list the following:

(1) *I* (or *y*) as in "my," "high," "lie," "die," etc., represented by an inverted point (or caret). That it is proper to represent this sound as a diphthong is evident, when we conisder that it is really a compound sound of long *a* (*ah*) and long *e* (*ee*) pronounced rapidly. Thus: *ah-ee.*

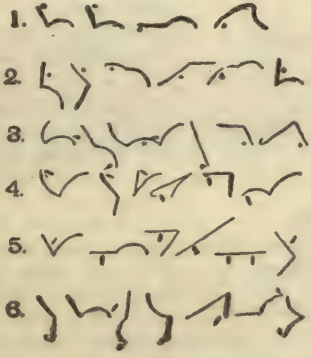
(2) *Ow,* as in "now," "how," "cow"; also representing the sound of *ou* in "thou," and of *ough* in "plough." However, it is necessary to remember that when *ow* is sounded *oh,* as in "bow" (the instrument to shoot an arrow), "mow" (the *verb*), "sow" (the *verb*), the second-place *long vowel* sign of *oh* is used, instead of the diphthong—shorthand outlines always representing sounds rather than letters, as already stated. The phonetic sign for the diphthongal sound of *ow* is a caret or point turned upward.

(3) The sound of *oi* (or *oy*), as in "boy," "toy," "joy," "void," etc. This is a combination of the sounds of long *o* (*oh*) and long *e* (*ee*) pronounced rapidly. Thus: *oh-ee.*

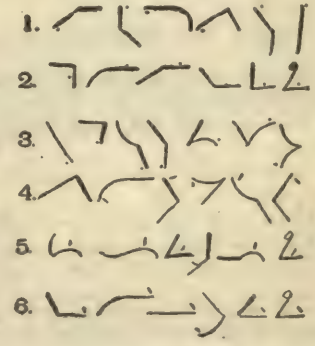
EXERCISE ONE



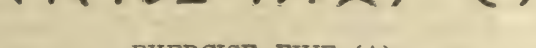
EXERCISE THREE



EXERCISE FIVE



EXERCISE THREE (A)



EXERCISE FIVE (A)



(4) The sound of *ew* or *u* with the affected pronunciation of *yu*, used by many people in such words as "new" (pronounced *ne-yoo*), "lute" (pronounced *le-yoot*), although the prevailing custom is to give a simple *oo* sound in most such words. However, this diphthong sign would be used in such words as "view." The sign is a small semicircle, like an inverted *U*.

(5) The sound of *wi*, as in "wide," "wine," "swine," etc., is a small right angle.

All these signs are shown in Exercise 7, where they are represented as preceding the sign for *T*. According to the rule of use, the sign for *oi* is always written in the *first place; yu* and *ow*, in the *third place*, and the *i* (as in "my," "thy") and *wi* in *either of the three places*, as is most convenient. These matters may all be understood by carefully studying Exercise 7 with its key.

KEY TO EXERCISE SEVEN

Line 1.—The diphthongs I, oy or oi, wi, ow, U.

Line 2.—Tie, ice, type, tide, time, like, chime.

Line 3.—Boy, envoy, annoy, alloy, coy, joy, toy.

Line 4.—Wide, widely, wife, Wite.

Line 5.—Out, cow, bow, thou, now, loud.

Line 6.—Pew, few, due, cure, fury.

The following *grammalogues* are also represented after this exercise:

I (1), why (1), how, you, our (3), use (noun) or see (3), use (verb) or whose (3), by (1).

In mastering this exercise, copy the outlines given, and read aloud as you write, the above examples; but do not simply copy them unless you know how and why the signs mean what they read. Observe closely the angles of the diphthong signs, whether downward, upward, to the left, at the top, or bottom. We might give you, in this lesson, much more to study, but it is best not to try to do too much all at once. If you learn these perfectly, you can exercise yourself in making other words like them from such lists as the following, or from books or newspapers. The following words are carefully chosen with a view to illustrating the rules already given:

Lime, mighty, joyous, pneumatic, noisy, enjoy, duty, owl, pioneer, deny, isle, icy, endow, endue, accuracy, power, higher, review, Nile, foil, rout. Irish, July, piety, avenue.

THE CIRCLE S (ISS)

As will be seen by referring to the phonetic alphabet already given, there are two signs for S used in shorthand; the first is a part of a curve, called *ess*, the second a *circle*, called *iss*. The *ess* is, accordingly, called "stroke-S." The circle *iss* also serves in some words for the Z (*zee*) stroke.

The strokes for S and Z are used principally when a vowel immediately precedes or follows a consonant sign. The circles for S and Z are used principally when two consonant sounds—one of which is S come together in a word. Thus the strokes for S and Z are used at the beginning or end of an outline always for some particular reason.

(1) The circle S (*iss*) is always to be formed by a movement of the pen or pencil backward—*i.e.*, from left to right or contrary to the hands of a clock. It thus comes *at the right side* of an upright or slanting down-stroke; *on the left side* of an upstroke, and *on the upper side* of a horizontal stroke. It is necessary to observe this rule carefully, since, when the circle is at the left or below, the significance is different, as will be explained in the section on "hooked consonants."

(2) Circle S forms a convenient means of joining two strokes; and, as shown in Exercise 9, when joining two straight lines, it is *outside the angle* formed by their meeting; when joining two curves, it is *inside the curve*. The direction followed in making the circle will always be apparent by observing the manner in which the strokes of the outline are joined together.

If this rule is always carefully observed, there will be no uncertainty in reading outlines, since the direction followed in making the circle will always be apparent by observing the manner in which the strokes are joined together.

(3) When the single *iss* circle stands at the beginning of a stroke, it is always sounded first; when it stands at the end of a stroke, it is always sounded last, no matter what the place of the vowel, which is sounded before or after the stroke, as indicated by position *before* or *after*.

(4) Double S, medial or final, is indicated by a *large circle, formed counterclockwise*, and connected to the strokes precisely like the single S. This is called *sess*, and corresponds to the sounds of *ses, sez, zes, zez, size*, etc., as in "exercise," "census," etc., as in Exercise 9.

(5) Such a large circle at the beginning of an outline indicates SW, as in "swear,"

"sweet," etc. It does not indicate the *sess*, as in "cessation," "secede," "sesame," the stroke S (*ess*) being used in such cases, as will be explained in the following paragraphs.

THE USES OF STROKE S

(1) Stroke S (*ess*) is used, when S is the only consonant in a word.

(2) Stroke S is used in a word *beginning with a vowel* followed by the S-sound.

(3) In a word ending with a *vowel sound* (not a silent vowel), immediately preceded by S, the stroke S is used.

(4) When the S-sound begins a word and is immediately followed by a vowel with another S- or Z-sound, the first S is a stroke, the second a circle (*iss*).

(5) Z-sound at the beginning of a word is *always* indicated by the stroke letter.

(6) When initial S is followed by two vowel-sounds in different positions, or final S is preceded by two vowels in different positions, the S-sound must always be represented by the stroke letter, in order to give opportunity for writing the two vowels in the outline. If this is not done the vowels will be mixed up in the outline.

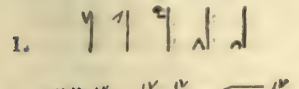
"STAY" AND "STER" LOOPS

The sounds of *st* and *ster* are commonly expressed by a sign resembling the circle S in respect to the way in which it is written and combined in outlines. Unlike the *iss*, however, the *st* loops are not circles but elongated ovals.

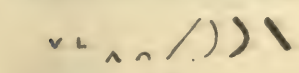
(1) The *"stay"* loop, corresponding to the syllable *st* or *sta*, as in "stay," "stand," etc., is a small elongated loop, as shown in Exercise 9, lines 11, 12, 13, 14. It may be used initially, medially, or finally. When, however, ST is at the end of a word followed only by a vowel sound it is spelled by using *circle* S (*iss*) followed by T (*tee*), in order to leave a place to write the final vowel. This may be seen in the word "dusty," whose outline is the third of Line 14, Exercise 9. Compare it with "dust," whose outline is the third of Line 11, in the same exercise.

(2) The *ster* loop, corresponding to the syllable, *ster* or *stor*, medial or final, in such words as "pastor," "minister," "masterpiece," is formed like the *stay* loop, except that it is fuller or wider in proportion to its length. Its formation and use are shown in Exercise 9, Line 15. As may be seen in the fifth outline of this same line ("posters"), the S of the plural is formed by continuing the line of the loop through the stroke letter on which it is written, and making a small circle over or on the other side of the stroke.

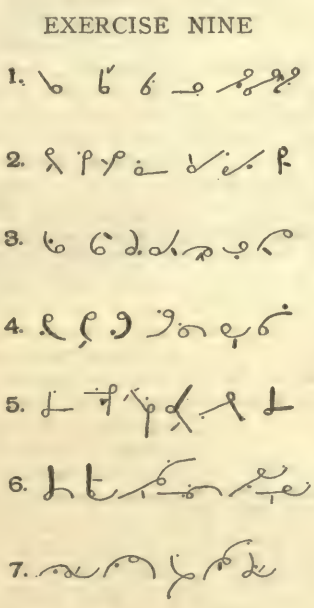
EXERCISE SEVEN

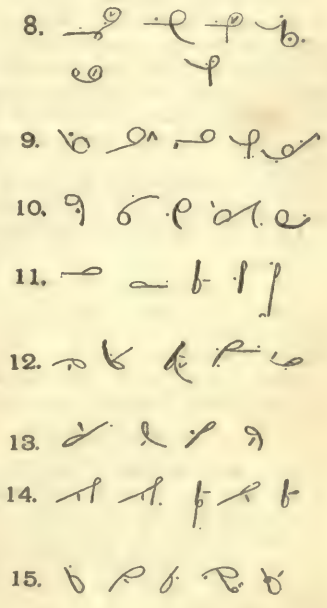


EXERCISE SEVEN (A)



EXERCISE NINE





KEY TO EXERCISE NINE

Line 1.—Pass, ties, chess, kiss, raise, house, yes.

Line 2.—Soap, sat, such, sack, sorry, sway, stow.

Line 3.—Face, thaws, cease, shows, mouse, neighs, laws.

Line 4.—Save, soothe, seize, sash, Sam, snow, seal.

Line 5.—Task, excite, opposite, Jessup, rasp, desk.

Line 6.—Dismay, dozen, rus(t)le, Kissam, raisin, cousin.

Line 7.—Mason, lacer, facile, loosely, season.

Line 8.—(Examples of large circle *sess* with vowel inserted.) Exercise, excessive, exhaust, indexes, census, insist.

Line 9.—(Circle *ses, sez, zes, zez.*) Paces, rouses, causes, necessity, necessary.

Line 10.—(Large circle SW beginning of outlines.) Swear, swell, swathe, swarthy, swing.

Line 11.—(*st* loop.) Cast, stick, dust, staid, statute.

Line 12.—Most, vestry, justify, elastic, (h)onest.

Line 13.—Story, stuff, stage, store.

Line 14.—(*st* loop with vowel following or between S and T.) Russett, rusty, dusty, rust, dust.

Line 15.—(*"ster"* loop medial or final.) Pastor, lustre, Chester, masterpiece, posters.

EXERCISE TEN

(All grammalogues thus far given.)

We may go to see him if he can have us. I may give the thing to them. We shall see if they all think so. How can you see in it? It was put on my eye, but I think it may be had by all who wish to use it. How are you, and which hour do you wish to come? Why are we to use them? Shall we see whose they may be or can all of us have the use of them? We may have them, but they should all see our use of them.

Carefully review the lists of logograms already given, reading them by means of their keys, and write this exercise out in shorthand. Then read it from the signs, etc., until all the logograms are thoroughly memorized.

PHONOGRAPHIC HOOKS

After the student has carefully mastered what has gone before, he is in a position to write shorthand with moderately good ease and effect. From some points of view, it is even advisable that he go no further until he has thoroughly mastered the characters and principles already laid down, so as to be able to write all previous exercises with ease. In entering, however, upon the study of what might properly be called the SECOND PART of this treatise, he must understand that the various abbreviations found in the *hook characters* are adopted for no other reason than to assist him to the end of making his outlines shorter and less complicated—hence, to be more rapidly written and more easily read. Of course, the matter demands earnest and careful study; but the further we go in this manner, the simpler seem all things that follow.

THE W AND Y DIPHTHONGS

When a word begins with either a W or Y sound followed by a long or a short vowel, it may be spelled with a W or a Y *diphthong*, so-called, instead of by the use of a hooked stroke *way* or *yay*, as given in the phonographic alphabet. These signs are called *diphthongs*, because, as phonographic teachers remind us, "W is really *oo* and Y is really *ee*." Hence another vowel sound following either of them forms what is practically a diphthong.

The W diphthongs are represented by small semicircles, each laid on one side, and the Y diphthongs by small semicircles opening either upward or downward.

Thus, *wah, way, wee,* are represented by small heavy semicircles *opening to the right; wah, woh, woo,* by small heavy semicircles *opening to the left;* the difference in each case being denoted by the *position* of the sign on the consonant outline, as in the simple long vowels already noticed. In other words, these diphthongs take *first, second,* or *third* place, according to the vowels with which they are compounded.

The Y diphthongs, *yah, yay, yee,* are denoted by small heavy semicircles opening *upward,* and occupy first, second, and third place, respectively. *Yaw, yoh, yoo* are small heavy semicircles opening *downward,* and occupying first, second, and third place, respectively.

The diphthongs compounded with the *short vowels, a, e, i, o, u, oo,* may be represented in similar fashion with W and Y, but by *light semicircles.* However, it will seldom be found necessary to make this distinction in practical shorthand work.

HOOKED CONSONANTS

The most notable of the hooked consonants are the L hooks and the R hooks, as shown in the annexed diagram. As may be seen here, the L hook is formed in the same direction as the crook of the first fin-

ger of the *left hand:* the R hook, in the same direction as the crook of the first finger of the *right hand*. Consequently, in order to remember which is which, the student need only recollect that L stands for *left* and R stands for *right*. These hooks are placed *at the beginning* of a stroke, which thereafter has the sound of the consonant indicated followed by L or R. Both are shown

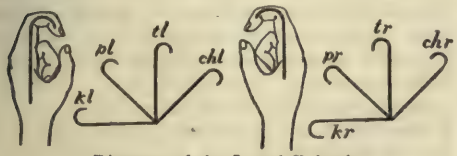


Diagram of the L and R hooks.

combined with the *light strokes* for K, P, T, CH, but can be as correctly combined with the *heavy strokes* for G, B, D, as occasion requires, in precisely the same manner. These hooks may also be combined with any other stroke letters.

VOWELS INSERTED ON INITIAL HOOKS

When an L or R hook is written on a stroke consonant, as already explained, we have the combinations, GL, KL, PL, BL, GR, KR, PR, BR, etc., with any vowel sounds following, as in "gland," "grand," "clay," "gray," etc. When, however, a vowel sound is to come between the component consonants, as in "German," "chairman," "torment," "school," etc., a variation in the vowel signs is necessary.

(1) A *dot vowel* (*ah, ay, ee,* and short *a, e, i*) is written as a *small circle*, instead of a simple dot. The circle for a *long vowel* sound *precedes* the stroke letter *at the left*, or *above* the horizontal; the circle for a *short vowel* sound *follows* the stroke letter *at the right*, or *below* the horizontal.

(2) A stroke vowel (*aw, oh, oo,* and short *o, u, oo*), or a diphthong sign is *drawn through* the stroke letter.

(3) When an initial hook would interfere with a *stroke vowel* or a *diphthong* sign, the stroke or sign may be written *before* the hook.

KEY TO EXERCISE ELEVEN

W AND Y DIPHTHONGS

1. Twelve, twenty, wish, word, railway, frequent, Asia, India.
2. Associate, association, year, yearly, yard, period, folio, ratio.
3. Boxwood, password, patriot, fuchsia, recreation, variation, various.
4. Area, Persia, piano, sinew, mania, curious, warm.

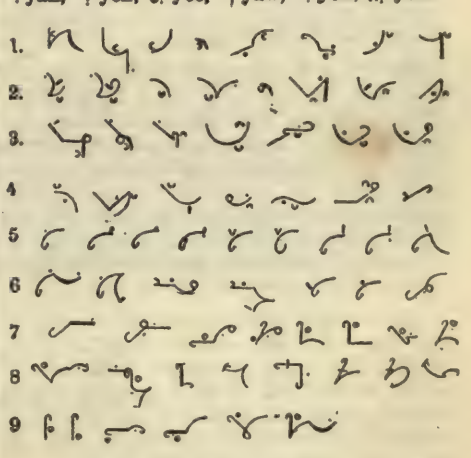
VOCALIZATION OF INITIAL R AND L HOOKS

5. Well, weal, well, Willie, wile, while, wool, woolly, wolf.
6. Willing, wealthy, weakness, wakeful, wall, wail, walker.
7. Willow, woollen, careless, cheerless, term, dark, perfect, charm.
8. Parliament, external, dormant, north, curtain, churl, churlish, former.
9. Tell, till, garment, girl, parcel, darling.

EXERCISE ELEVEN

wah, weh, wee, waw, woh, woo.

yah, yeh, yee, yaw, yoh, yoo.



KEY TO EXERCISE TWELVE

1. Pray, pry, brew, adder, eager.
2. Play, addle, eagle, glue, through.
3. Broke, baker, couple, paper.
4. Block, buckle, copper, coffer.
5. Bible, teacher, cover, measure, lever.
6. Gather, sugar, liver, leisure, Homer.
7. Talker, tanner, dinner, banner, joiner.
8. Banker, finger, linger, lumber.
9. Flow, flee, flame, flock.
10. Fled, panel, funnel, flannel.

DOUBLE CONSONANTS

In order to prevent confusion in the student's mind regarding the distinction between the L and R hooks combined with stroke letters and the *double consonants*, KW, GW, WH, WL, and WHL, and with the characters for W and Y, as shown in the alphabet, it is necessary only to call attention to the fact that the hooks of the double consonants are to be made deliberately larger than those of the L and R

characters. Thus, KW will not be confused with KL, nor GW with GL. Regarding the WH, we may call attention to the fact that it is to be made with an *up-stroke*, and consequently can not be confused with CHN, which is a *down-stroke*. Regarding W, Y, WL, and WHL, the same remark applies. In writing WL the hook is made smaller than in WHL.

CIRCLE S (*ISS*) BEFORE INITIAL HOOKS

When it is necessary to write S before any hooked consonant of the L or R series, the circle S (*iss*) is used, *only, contrary to the rule previously stated*, it is written with a *forward* movement—*i.e.* in the same direction as the hands of a clock.

WITH THE R SERIES, the circle S—making signs for the sounds of SKR, SPR, STR, etc., or outlines with these and other consonants of the series—is merely written *to the left* of the upright and slanting strokes, and *below* the horizontal strokes. The meaning is thus unmistakable, since with the simple S sound the circle is to the right of the uprights and slants and above the horizontals, as we have already stated.

WITH THE L SERIES, the circle S—making the signs for the sounds of SPL, STL, SCHL, SKL, etc.—is written *inside* of and at the shorter end of the L hook, although written *counter-clockwise*. The same rule applies to the double consonant, KW, in which the hook is larger than in KL.

When a consonant sound indicated by either an L or an R hook follows S in the middle of a word, the S circle is always written on the shorter end of the hook, unless the sign having the R hook follows a straight stroke *made in the same direction*. In the latter case the combined S and hook sound is indicated as if initial.

An ST loop or an SW circle may be written to a consonant sign of the L or the R series by observing the same rule of making the direction of movement *the same as the hands of a clock;* the stroke continuing the circle or loop.

In connection with the R series, it is desirable to remark at this point that the phonographic symbols for H, both up-stroke and down-stroke, represent the characters not liable to be used. Thus, the down-stroke H might indicate the combination SCHR, which would scarcely represent any English word. The up-stroke H could indicate nothing else than SRR, which would have to be otherwise written in an outline.

FINAL CONSONANT HOOKS

Just as the sounds of L and R may be added to other consonants at the beginning or middle of a word by the use of hooks, so the sounds of N and of F and V may be indicated by the use of the proper *final* hooks. The final N hook is made in the same direction as the initial L hook (being indicated by the crook of the left forefinger), and the final F or V hook, in the same direction as the initial R hook (being indicated by the crook of the right forefinger).

Thus, when N is the last sound in a word—not being followed by a vowel—it may be indicated by a hook at the finish of a straight stroke, *turning to the left* for slants and uprights, and to the *right* for *slanting up-strokes*, R, W, and H. With *curved strokes*, it simply continues the direction of the curve.

The final F or V hook is used most usually with straight strokes, and with them is the reverse of the N hook—being written *to the right* of slanting and upright down-strokes, and *to the left* of slanting up-strokes, R, W, H.

The N and F hooks can be used medially in any word, provided a sufficient space be allowed to draw them in.

When a vowel sound follows N, F or V, at the end of a word, the proper stroke letter must be used instead of the hook. (A similar rule applies in the use of the ST loop as already explained.)

VOCALIZING FINAL HOOKS

Final hooks may be *vocalized* (*i.e.* a vowel may be inserted between the component consonants) in precisely the same manner as has been explained in connection with the *initial hooks*. Dot vowels are expressed by circles, before for long, after for short; stroke vowels or diphthongs may be drawn *through* the stroke consonant. Also, when the final hook might interfere with the stroke vowel or the diphthong sign, either of them may be placed *after* the hook.

CIRCLE S AND FINAL HOOKS

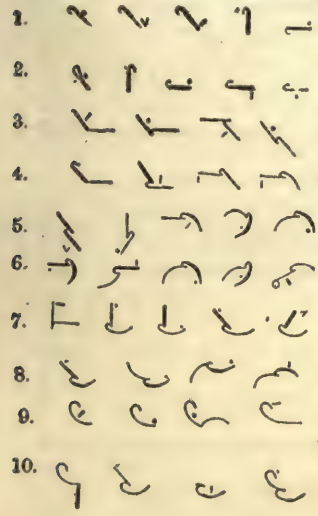
Circle S may be added to a final hook (F, V, or N) in precisely the same manner that it is prefixed to an initial L or R hook, as already explained. In so doing it is essential only to carefully make the circle in the opposite direction from that in which it indicates simply final S.

Thus, while circle S is written to the RIGHT of *slanting* and *upright down-strokes*,

on the UPPER SIDE of a *horizontal straight stroke*, and to the LEFT of *up-strokes*, the final NS circle (the N hook continued and closed into a circle) is at the LEFT of *slanting* and *upright down-strokes*, BELOW a *horizontal straight stroke*, and to the RIGHT of *up-strokes*.

Noting, however, that the *final* S circle merely continues the bend of a curved stroke, the distinction is made with NS by making the N hook continue the bend and drawing the S circle on the short end of the hook. The distinction between the NS and the VS or FS circles is preserved by using the *stroke* N and circle S wherever

EXERCISE TWELVE



EXERCISE THIRTEEN



EXERCISE FOURTEEN



there might be confusion of word outlines. Circle NS is used most generally for the NZ sound, and stroke N with circle S for the NS sound.

The circle S with F and V hooks is written on the same plan as with the initial L hooks, on the short end of the hook, which is made *to the right* of the inclined and upright down-strokes, *above* a horizontal, and *to the left* of *up-strokes*.

THE "SHUN" HOOK

As we have already learned, the size of a *hook* or *circle* modifies the sound indicated. Thus, a *small circle* indicates S, or Z (written heavier), and a *small hook*, R or L initial or N or F, V, final; while a *large circle* stands for SW, and a *large hook*, for KW (*qu*), GW, WH, etc. In the same way, a *large final* hook stands for the sound represented by the syllables, *tion, sion,* and *tian, sian,* with the sound of SHUN or ZHUN.

Several rules govern the use of this hook:

(1) After a stroke letter beginning with a hook or circle (L, R, S, etc.) it is written on the side *opposite* to the hook or circle.

(2) After a simple stroke letter it is written on the side opposite to the vowel or to the accented vowel, if there are more than one (as before and after the stroke).

(3) After a curved stroke it is written within, as a continuant of the curve.

(4) After T, D or J, straight strokes, *without hooks, circles* or *loops*, the SHUN hook is written *to the right* of the stroke.

(5) When circle S precedes this hook, as in "possession," "position," etc., it is expressed by continuing the circle to the opposite side of the stroke letter.

(6) When circle S (final) follows a SHUN hook, also preceded by an S sound, a circle may be written upon the extended hook made as explained in Rule 5.

(7) The SHUN hook may be used medially, like other hook and circle letters.

These matters will be made clear by reference to the following exercises.

KEY TO EXERCISE THIRTEEN

DOUBLE CONSONANTS

1. Way, whey, ware, where.
2. Wail, whale, quire, quiet, quibble.

CIRCLE S AND INITIAL HOOKS

3. Screw, scrap, scrimmage, scribble.
4. Scraper, supply, suffer, squabble, squall.

FINAL N AND F HOOKS

5. Bone, bun, tune, town, twine, dine.
6. Puff, proof, beef, brief, bluff, tough, trough

"SHUN" HOOK

7. Nation, motion, occasion, action, donation.

S AND FINAL HOOKS

8. Pass, pans, dose, deigns, cheese, chance.
9. Lawns, loans, tosses, pounces, tenses, expenses.

FINAL HOOKS AND FINAL VOWELS

10. Wave, wavy, mastiff, mystify, tin, tiny.

DOT, CIRCLE AND TICK SIGNS

Several notable shorthand abbreviations are formed with *ticks, circles,* and *dots,* as follows:

THE PREFIX CON OR COM is indicated by a *light dot* at the beginning of a stroke letter, *above* a slant or upright, and *to the left* of a horizontal (not in any vowel position).

THE SUFFIX ING is a precisely similar *light dot* at the end of a word stroke.

THE SUFFIX INGS is a *small detached circle* at the end of an outline.

THE SUFFIX ING followed by "the" is a *small detached dash* following an outline.

NOTE.—Whenever it is more convenient, the stroke NG (*ing*) may be used, instead of the *circle, dot,* or *dash* already mentioned.

THE ASPIRATE, H, is expressed by two stroke signs, one upward, the other downward, but may be indicated by a *tick* joined at an angle or across the top to the end of the stroke letters. It is then read *before* the vowel preceding the stroke consonant.

H may also be expressed by an additional dot before a *vowel dot* or *dash* preceding a stroke consonant.

HALVING CONSONANT STROKES

The principle of *halving* consonant strokes is another notable method of saving time in writing phonographic outlines. According to this principle *thin strokes* made at half length indicate not only P, T, CH, K, F, TH, S, etc., but these letters followed by T. Thus, the curve stroke M made at full size and followed by the sign of the diphthong I (as in "my"), spells "my," but made at half length and followed by the same diphthong spells "mite."

Heavy strokes indicate the same letters, or their heavy equivalents, followed by D. There may be uncertainties at times regarding those halved outlines, but generally the matter is simple. Thus, when the curves for M, N, L, R are halved and thickened to represent MD, ND, LD, RD, there is no uncertainty in reading the outline, since the rule is never to halve the *heavy curves,* MP, NG. LER, RER, except when they have a final or initial hook.

KEY TO EXERCISE FOURTEEN

DOWNWARD H

1. Hoe, high, huge, highly, hack.

UPWARD H

2. Hod, hobby, heady, haughty.

TICK H

3. Hussy, hem, home, whom, Hume.

DOT H

4. Half, hath, heaven, manhood, handy-help.

UPWARD AND DOWNWARD L AND R

5. Dare, deary, char, chary, vile.
6. Villa, fell, fellow, ear, ray.

HALVING LETTERS

7. Sent, send, sound, hand, made, mad, middle.
8. Fatted, fitted, spotted, plated, coated, cheated.
9. Beautiful, doubtful, rapid, habit, alphabet.
10. A friend in need is a friend indeed.

PUNCTUATION MARKS

It is necessary to avoid all marks and signs that might be confused with stenographic signs. Consequently, the period (.) is denoted by a small cross (x), and the dash (—) by a line with two tails(⟵⟶). In indicating a capital letter, as, for example, a proper name, two slanting parallel lines are written *to the left* of the outline (\\ ). Many stenographers consider that the best practice is to write a proper name in longhand, in order to avoid confusion. All other punctuations are the same as in longhand. All numbers are expressed by numerals (1, 2, 3, 4, etc.).

A few general rules for practical shorthand writing are as follows:

(1) Use abbreviated forms as soon as your facility in writing is established. The rule is to indicate the accented syilables, as Blet (2) for *believe it;* Dlet (2), for *deliver it,* etc.

(2) Write words ending in *er* same as the primitive word (without *er*), with the addition of downward R; as *pardoner,* Par-Den-Ar, instead of Per-Dee-Ner; *Dinner,* Den-Ar, instead of Dee-Ner; *Tinner, Tenor,* Ten-ar, instead of Tee-Ner.

(3) Make all words ending with R, with downward R; and all words with a final vowel following the R, with upward R; but R before J is always Ray. This is an established rule, yet often departed from with perplexing frequency; but it is suggested as a standing and *unexceptional* rule. So also with Ret and Ard, down or up, as followed or not by a vowel. So also with Lay and El, Let and Eld. As *disposal,* Dees Pees-El; down-hearted, Den-Art; retained, Ret-End; ordained, Ard-End, and numerous others. This rule thus provides a distinction between words ending in *er, ry, el,* and *ly,* which, in many cases, according to the Standard Dictionary, are written alike.

(4) Retain the Pitman Ler sign for *lr,* instead of Lay-Ar, which is longer, especially in compound words, as *Chandler,* Chent-Ler, instead of Chay-End, Lay-Ar.

(5) Write all words ending in *tionist* with the half-length *ess* up or down on the end of the *shon hook;* as *abolitionist,* Bee-Layshonst; *protectionist,* Pret-Kayshonst; *prohibitionist,* Per-Beeshonst; and as in *revolutionist, resurrectionist, secessionist, rationalist.*

(6) Write half the "I" sign in all phrases and compound words, as *eyelid, eyelet, I am, I may, etc.*

(7) Write *Ther* joined, and *of* understood, instead of double length Veether (1), to express *of their;* except when *of* is emphasized.

(8) Write *Ret* for *on,* before p, b, t, d, ch, j, b, v, n, ng, s, z, sh, zh, el, th, *th,* and y; *Chet* before k, g, Lay, Ar, Ray, w and m.

(9) Write *Ret* for *l,* above the line, before p, b, t, d, ch, j, k, g, s, and th; *Chet* before Ar, and Ray; *Pet* before m, and mp.

(10) *Should,* on the line, by *Ret* before p, b, d, t, ch, j; *Chet* before k, g, m.

(11) When *new* and *now* commence a phrase, write them below the line without the tick; as *nowadays,* En-Dees; *knew-there-were,* Enther-weh.

(12) Write "society" by S through the preceding word in all possible cases; in a few other instances, join the S, as in "good society," "modern society," etc.

(13) "I should" may be joined to the rest of the verb, before Ray or Lay, by Ret-Chet. As, I should rather, I should like.

(14) "Never have" may be written with Nef I—*i.e.,* En and Vee hook.

(15) "Being," if written alone, should be Bee-Ing; but in phrases simply Bee—as "for the time being," Ef-Tee-Bee.

(16) Write *half-lengths* to express *ality, idity, bility, ility, inity*—as Frugality, Fer-Gelt; principality, Per-Pelt; timidity, Tee-Med; fluidity, Fel-Det; stability, Stee-Belt; possibility, Pees-Blet; facility, Efs-Elt; futility, Fet-Elt; vicinity, Vees-Net. But after N hook, write Bee, or omit the hook, as in trainable.

Above all the student must practice writing from dictation. Whatever he writes he must read over and over again in order to become familiar with his notes.

WHO'S WHO OF HISTORY

THE following list of prominent names has been selected with a view to answering questions regarding the identity of characters frequently mentioned in literature and conversation. To enlarge it very much would involve filling a space that can not be spared in the present volumes, and any attempt to make it "complete" would speedily fill many hundred such pages as these. Then, again, it is by no means easy to decide exactly what constitutes a title to distinction in human affairs. Many persons have a place in history only because of their colossal wickedness, while many whose virtues should justly have rendered them immortal have all but been forgotten. Still others have rendered some small services to the progress of the race and are remembered, while many of the greatest benefactors of humanity still remain nameless. On the whole, fame consists more in continuing to become frequently mentioned than in the possession of noble qualities or in the performance of great services. This seems to be the verdict of history, and we must abide by it.

PROMINENT NAMES FROM ALL AGES

Aahmes or Amasis (572-528 B.C.), King of Egypt.
Aasen, Ivar Andreas (1813-), Norwegian philosopher, botanist, and poet.
Abano, Pietro d' (1250-1316), Italian physician and astronomer.
Abbadie, Jacques (1654-1727), French Protestant theologian.
Abbas I (1557-1628), Shah of Persia.
Abbas Mirza (1783-1833), Persian prince and warrior.
Abbatucci, Charles (1771-96), French general.
Abbe, Cleveland (1838-), b. New York. Astronomer and meteorologist.
Abbey, Edwin Austin (1852-), b. Philadelphia. A noted painter and illustrator.
Abbon of Fleury (945-1004), French theologian and diplomatist.
Abbot, Ezra, (1819-84), b. Maine. Biblical scholar.
Abbot, George (1562-1611), b. England. Archbishop of Canterbury.
Abbott, Austin (1831-96), b. Massachusetts. Lawyer and legal writer.
Abbott, Benjamin Vaughan (1830-90), b. Massachusetts. Lawyer and legal writer.
Abbott, Henry Larcom (1831-), b. Massachusetts. Soldier.
Abbott, Jacob (1803-79), b. Maine. Clergyman and author.
Abbott, John Stevens Cabot (1805-77), b. Maine. Historian.
Abbott, Lyman (1835-), b. Massachusetts. Clergyman and journalist.
Abdallatif (1162-1231), Arabian physician and philosopher.
Abd-el-Kadir (1807-83), b. Algeria. Arab chief.
Abd-er-Rahman (731-87), b. Damascus. Mussulman warrior.
Abdul Aziz (1830-76), Sultan of Turkey.
Abdul Hamid I (1725-89), Sultan of Turkey.
Abdul Hamid II (1842-), Sultan of Turkey.
Abdul Kasim Mausur ("Firdusi") (940-1020), great epic poet of Persia.
Abegg, Julius F. H. (1796-1868), b. Bavaria. Jurist.

Abel, Niels Henrik (1802-29), Norwegian mathematician.
Abelard, Peter F. (1079-1142), French scholar. Abbot of St. Gildas.
Abercrombie, James (1706-81), b. Scotland. British general.
Abercrombie, John (1780-1844), Scottish physician and philosopher.
Abercromby, Sir Ralph (1734-1801), b. Scotland. British general.
Abernethy, John (1764-1831), English surgeon and medical writer.
Abert, John James (1788-1863), b. Virginia. Military engineer.
About, Edmond F. V. (1828-85), French novelist, dramatist, and journalist.
Abrabanel, Isaac (1437-1508), b. Portugal. Jewish scholar and statesman.
Abraham-a-Sancta-Clara (1644-1709), b. Baden. Preacher and satirical writer.
Abraham ben Meir ibn Ezra (1092-1167), b. Spain. Scholar, astronomer, and mathematician.
Abt, Franz (1819-85), b. Saxony. Composer of music.
Abulfeda, Ismael ben-Ali Emad-eddin (1273-1331), b. Damascus. Arabian geographer and historian.
Accius, Lucius (abt. 170 B.C.), Roman tragic poet and prose writer.
Accolti, Benedetto (1415-66), Italian jurist and writer.
Accolti, Francesco (1418-83), Italian jurist.
Accorso, Francesco (1180-1260), Italian jurist.
Accum, Friedrich Christian (1769-1838), German chemist.
Achard, Louis A. E. (1814-75), French novelist and dramatist.
Achenbach, Andreas (1827-), German painter.
Achenbach, Oswald (1827-), German landscape painter.
Achenwall, Gottfried (1719-72), German scholar and professor.
Achmet I (1589-1617), Sultan of Turkey.
Achmet III (1673-1736), Sultan of Turkey and warrior.
Ackermann, Johann C. G. (1756-1801), German medical writer.
Ackermann, Konrad Ernst (1712-71), German actor.
Acland, John Dyke (d. 1778), English soldier and politician.
Acosta, Gabriel de (1591-1647), Portuguese philosopher.
Acosta, José de (1540-1600), Spanish Jesuit historian.
Acton, Sir John F. E. (1736-1811), b. France. Naval officer, and later Prime Minister at Naples.
Adair, John (1759-1840), b. South Carolina. Politician and soldier.
Adair, Sir Robert (1763-1855), English diplomat and historical writer.
Adam of Bremen (d. abt. 1076), German ecclesiastical historian.
Adam, Mme. Edmond (1836-), French journalist and editor.
Adam, William (1751-1839), b. Scotland. British lawyer and politician.
Adamnan, Saint (624-704), b. Ireland. Celtic ecclesiastic.
Adams, Charles Francis (1807-86), b. Massachusetts. Statesman and diplomatist.
Adams, Charles Francis, Jr. (1833-), b. Massachusetts. Soldier and historical writer.
Adams, Hannah (1755-1832), b. Massachusetts. Author.
Adams, John, (1735-1826), b. Massachusetts. A leader of the Patriot party; delegate to the Continental Congresses; signer of the Declaration of Independence; second President of the United States 1797-1801.
Adams, John Couch (1819-92), English astronomer.
Adams, John Quincy (1767-1848), b. Massachusetts. U. S. Minister to the Netherlands, Prussia, Russia, and England; member of the Senate and of the House; Secretary of State 1817-25; sixth President of the United States 1825-29.
Adams, Samuel (1722-1803), b. Massachusetts. A leader of the Patriot party; member of the Continental Congresses; signer of the Declaration of Independence; Governor of Massachusetts.
Adams, Thomas (d. abt. 1640), English Puritan divine.
Adamson, Robert (1852-), Scottish philosophical writer.
Addison, Joseph (1672-1719), English essayist, poet, and statesman; noted for his papers in the "Tatler" and "Spectator."
Adelard of Bath (12th century), English philosophical writer.
Adelung, Friedrich von (1768-1843), German philologist.
Adelung, Johann Christoph (1732-1806), German philologist.
Adenet (13th century), French poet.
Adler, Felix (1851-), b. Germany. Educator, establisher of the New York Society for Ethical Culture.
Adlersparre, Count Georg (1760-1835), Swedish author, statesman, and general.
Ado, Saint (800-75), Archbishop of Vienna.
Adrian or Hadrian I, Pope (772-95).
Adrian or Hadrian II, Pope (884-85).
Adrian or Hadrian IV (Nicholas Breakspear), b. England. Pope 1154-59.
Adrian or Hadrian VI (1459-1523), b. Holland. Pope 1522-23.
Adrian de Costello (1460-1521?), Italian ecclesiastic and scholar.
Æschines (389-314 B.C.), noted Athenian orator; political antagonist of Demosthenes.
Æschylus (525-426 B.C.), Greek poet; father of the Greek tragic drama.
Æthelbert (552-616), King of Kent 560-616.
Æthelred II, surnamed "The Unready" (968-1016), King of England 974-1016.
Aëtius (395-454), b. Silistria. Roman general.
Afranius Nepos, Lucius (d. 46 B.C.), Roman consul and general.
Afzelius, Adam (1750-1837), Swedish naturalist.
Afzelius, Arvid August (1785-1871), Swedish writer and scholar.
Agardh, Jakob Georg (1813-), Swedish naturalist.
Agardh, Karl Adolf (1785-1859), Swedish naturalist and political economist.
Agassiz, Jean L. R. (1807-73), Swiss-American naturalist; professor of geology and zoology at Harvard.
Agesilaus II (d. abt. 360 B.C.), King of Sparta 399-61.
Agoult, Comtesse d' (1805-76), French author.
Agricola, Cnæus Julius (37-93), Roman soldier and statesman.
Agrippa I, Herod (11 B.C.—44 A.D.), Roman commander and statesman.
Agrippa II, Herod (27-93), King of northern Palestine 52.

Agrippa, Marcus Vipsanius (63-12 B.C.), Roman commander.
Aguesseau, Henri François d' (1668-1751), French jurist.
Aguilar, Grace (1816-1847), English author.
Aguinaldo, Emilio (1870-), b. Luzon. Leader of the Philippine insurrection; captured by General Funston 1901.
Ahab, King of Israel (abt. 876-854 B.C.).
Ahasuerus. Name of several Median and Persian kings.
Ahaz, King of Judah (abt. 742-727 B.C.).
Ahrens, Heinrich (1808-74), German philosophical writer and jurist.
Airy, Sir George Biddell (1801-92), English astronomer.
Akbar or Akhbar (1542-1605), Mogul emperor in India.
Akenside, Mark (1721-70), English poet and physician.
Alarcon, Hernando de (16th century), Spanish navigator.
Alarcon y Mendoza, Juan R. de (1588-1639), Spanish dramatic poet.
Alaric (abt. 376-410), King of the Visigoths.
Albert or Albrecht (1414-86), Elector of Brandenburg.
Albert or Albrecht (1490-1568), Margrave of Brandenburg-Ausbach.
Albertus Magnus (b. abt. 1200—d. 1280), German scholastic philosopher.
Albucasis or Abul-Casim (d. abt. 1106), b. Spain. Arabian physician.
Albumazas (abt. 805-85), Arabian astronomer.
Albuquerque, Affonso de (1452-1515), Portuguese navigator and conqueror.
Alcæus (abt. 611-580 B.C.), Greek lyric poet.
Alcibiades (b. abt. 450 B.C.—d. 404), Athenian general and politician.
Alcman (7th century B.C.), Spartan lyric poet; originally a Lydian slave.
Alcott, Amos Bronson (1799-1888), b. Connecticut. Philosophical writer and educator.
Alcuin (735-804), English prelate and scholar.
Aldred (d. 1069), English ecclesiastic; Archbishop of York 1060.
Aldrorandi, Ulisse (1522-1605), Italian naturalist.
Alembert, Jean B. C. R. d' (1717-83), French mathematician.
Alesius, Alexander (1500-65), Scottish controversialist and reformer.
Alexander III, surnamed "The Great" (356-323 B.C.), King of Macedon and "conqueror of the world."
Alexander III (Rolando Ranuccio), d. 1181; born Italy. Pope 1159-81.
Alexander VI (Rodrigo Borgia) (1431-1503), b. Spain. Pope 1492-1503.
Alexander of Hales (d. 1245), English theologian and philosopher.
Alexander I of Russia (1777-1825), crowned Emperor 1801.
Alexander II of Russia (1855-81), emancipated the serfs 1861.
Alexander III of Russia (1845-94), crowned 1881.
Alexander, Archibald (1772-1851), b. Virginia. Clergyman and educator.
Alexander, Sir William (b. abt. 1567—d. 1640), Scottish poet and statesman.
Alexander Nevski, Saint (1219-63), Russian national hero.
Alexander Severus, Marcus Aurelius (abt. 205-235), b. Phœnicia. Emperor of Rome 222-235.
Alexis or Alexei (1629-76), Czar of Russia.
Alexius I (Comnenus) (1048-1118), Byzantine emperor 1081-1118.
Alfieri, Count Vittorio (1749-1803), b. Piedmont. Italian dramatist.
Alfonso III, surnamed "The Great" (848-912), King of Asturias and Leon.
Alfonso VI, surnamed "The Valiant" (1030-1109), King of Leon and as Alfonso I of Castile.
Alfonso X, surnamed "The Wise" (1221-84), King of Leon and Castile. Astronomer.
Alfonso I (abt. 1110—d. 1185), first King of Portugal.
Alfonso V, surnamed "The Magnanimous" (1385-1458), King of Aragon and as Alfonso I of Sicily and Sardinia, and of Naples
Alford, Henry (1810-1871), Dean of Canterbury; poet and scholar.
Alfred or Ælfred, surnamed "The Great" (849-901), King of the West Saxons. Legislator and scholar.
Alger, Cyrus (1781-1856), American inventor.
Ali, surnamed "The Lion of God" (b. abt. 600—d. 661), b. Mecca. Adopted son of Mohammed and fourth calif.
Alison, Sir Archibald (1826-), b. Scotland. British general.
Allen, Ethan (1737-89), b. Connecticut. Revolutionary commander; capturer of Fort Ticonderoga.
Allen, Ira (1731-1814), b. Connecticut. Revolutionary soldier and politician.
Allen, Joel Asaph (1838-), b. Massachusetts. Naturalist.
Alleyne or Allen, Edward (1566-1626), English actor.
Allouez, Claude Jean (1620-90), b. France. Jesuit priest and explorer in America.
Allston, Washington (1779-1843), b. South Carolina. Portrait and historical painter.
Almansur or Almansor (abt. 712—d. 775), Abbaside calif and patron of learning.
Alma-Tadema, Laurence (1836-), b. Netherlands. Painter, resident in England.
Almquist, Karl J. L. (1793-1866), Swedish author.
Alting, Johann Heinrich (1583-1644), b. Prussia. Theologian.
Alva, Duke of (1508-82), Spanish general. Governor of the Netherlands.
Alvarado, Alonzo de (abt. 1490—d. 1556), b. Spain. Soldier and aider of Cortez in the conquest of Mexico.
Alvarado, Pedro de (1485-1541), b. Spain. Soldier and aider of Cortez in the conquest of Mexico.
Alvinczy, Joseph, Baron von (1735-1810), b. Transylvania. Austrian field-marshal.
Ambrose, Saint (?340-397), b. Gaul. Bishop of Milan.
Amenemhot III (reigned abt. 2300 B.C.), Egyptian king.
Amenemhotep III (reigned abt. 1500 B.C.), Egyptian king and warrior.
Amherst, Jeffrey, Lord (1717-97), British field-marshal.
Ampère, André Marie (1775-1836), French physicist and electrician.
Amurath I or Murad (1319-89), Sultan of Turkey 1359-89.
Anacreon (?563-478 B.C.), Greek lyric poet.
Anaxagoras (500-428 B.C.), Greek philosopher
Anaximander (610-547 B.C.), Greek philosopher.
Anderson, Robert (1805-71), b. Kentucky. American general, defender of Fort Sumter.
Andrassy, Gyula, Count (1823-90), Hungarian statesman.
André, Major John (1751-80), b. England. British spy.
Andrews, Lancelot (1555-1625), English divine.
Andronicus, Livius (abt. 284-204 B.C.), Latin dramatic poet.
Andros, Sir Edmund (1637-1714), English colonial governor successively of New York, New England, and Virginia.

Anne, Queen of England (1664-1714).
Anselm, Saint (1033-1109), b. Italy. Archbishop of Canterbury 1093-1109.
Anson, George, Lord (1697-1762), b. Ireland. English admiral.
Anthony of Padua, Saint (1195-1231), Franciscan monk and theologian.
Anthony, Susan Brownell (1820-), b. Massachusetts. Reformer.
Antiochus, surnamed "The Great" (237-187 B.C.), King of Syria 223-187.
Antipater (d. 319 B.C.). Macedonian general.
Antiphon (abt. 480-411 B.C.), Athenian orator.
Antony, Mark, Marcus Antonius (abt. 83-30 B.C.), Roman triumvir and general.
Apelles (fl. 330 B.C.), Greek painter.
Apollodorus (fl. abt. 404 B.C.), Greek painter.
Apollonius, surnamed "Tyaneus" (abt. 4 B.C.—97 A.D.), b. Asia Minor. Pythagorean philosopher.
Aquinas, Thomas, Saint (?1225-74), Italian theologian and philosopher.
Arago, Dominque François (1786-1883), French astronomer and physicist.
Aratus (271-213 B.C.), Greek statesman and general.
Archimedes (abt. 287-212 B.C.), b. Syracuse. Geometrician, inventor of the water-screw.
Ariosto, Ludovico (1474-1533), Italian poet.
Aristarchus (20th century B.C.), Greek grammarian and critic.
Aristides, surnamed "The Just" (?d. 468 B.C.), Athenian statesman and general.
Aristophanes (abt. 450-380 B.C.), Greek comic poet.
Aristotle (384-322 B.C.), Greek philosopher.
Arius (256-336), Greek patriarch of Alexandria and founder of Arianism.
Arkwright, Sir Richard (1732-92), b. England. Inventor of the spinning-frame.
Arminius (18 B.C.—21 A.D.), German chieftain and patriot.
Arnim, Count Harry K. K. E. von (1824-81), German diplomatist.
Arnold of Brescia (1100-1155), Italian reformer.
Arnold, Benedict, surnamed "The Traitor" (1741-1801), b. Connecticut.
Arrian, L. Flavius Arrianus (b. abt. 100), b. Asia Minor. Greek historian and philosopher.
Artaxerxes I, surnamed "The Long-handed," King of Persia 465-425 B.C.
Arthur, Chester Alan (1830-86), b. Vermont. Vice-President and 21st President of the United States 1881-85.
Asbury, Francis (1745-1816), first Methodist bishop in America.
Aschàm, Roger (1515-68), English scholar, instructor of Queen Elizabeth.
Ashburton, Alexander Baring, Lord (1774-1848), English financier and statesman.
Asurbanipal or Sardanapalus, King of Assyria, 668-626 B.C.
Asurnazirpal, King of Assyria, 884-860 B.C.
Athanasius, Saint (?296-373), Greek father of the Church.
Atticus, Titus Pomponius (109-32 B.C.), Roman scholar.
Attila, surnamed "The Scourge of God" (-453), King of the Huns.
Audubon, John James (1780-1851), b. Louisiana. Ornithologist.
Augustine, Saint (354-430), b. Africa. Latin Church father.
Augustus, Caius Julius Cæsar Octavianus (63-14 B.C.), first Roman emperor and noted warrior.
Augustus III, Frederick (1696-1763), elector of Saxony and King of Poland.
Aurelian, Claudius Domitius (?212-275), Roman emperor.
Aurung-Zeb (1619-1707), Emperor of Hindustan 1658-1707.
Avicenna (980-1037), b. Bokhara. Arabian physician and philosopher.

B

Bach, Johann Sebastian (1685-1750), German musical composer.
Bacon, Francis, Lord Verulam (1561-1626), English statesman and essayist.
Balfour, Arthur James (1848-), English politician.
Balzac, Honoré de (1799-1850), French novelist.
Bancroft, George (1800-1891), American historian.
Barnéveldt, Jan van Olden (1547-1619), Dutch statesman.
Barnum, Phineas Taylor (1810-1891), American showman.
Barrow, Isaac (1630-1677), English theologian and scholar.
Bartham, John (1699-1777), American botanist.
Bartholdi, Fréderic Auguste (1834-), French sculptor.
Barye, Antoine Louis (1795-1875), French sculptor.
Basil, St. (329-379), Father of the Church.
Baxter, Richard (1615-1691), English preacher.
Bayard, Pierre du Terrail, Chevalier (1476-1524), French knight.
Beauharnais, Eugène de (1781-1852), Viceroy of Italy under Napoleon.
Beaumont, Francis (1506-1536), English dramatist.
Beauregard, Pierre Gustave Toutant (1817-1893), Confederate general.
Becket, Thomas à (1119-1170), English archbishop.
Bede (Venerable) (673-735), English monk and scholar.
Beecher, Henry Ward (1813-1887), American preacher.
Beecher, Lyman (1775-1863), American preacher.
Beethoven, Ludwig van (1770-1827), German musical composer.
Belisarius (505-564), Byzantine general.
Bell, Alexander Graham (1847-), inventor of telephone.
Bell, Currer, pseudonym of Charlotte Brontë.
Bellamy, Edward (1850-1898), American economist and writer.
Belshazzar, last king of Chaldean dynasty in Babylon.
Benedict, name of fourteen Popes.
Benedict, St. (480-543), founder of monasticism in West.
Benvenuto Cellini (1500-71).
Berlioz, Hector (1803-1869), French musical composer.
Béranger, Jean Pierre de (1780-1857), French poet.
Berkeley, George (1684-1753), English bishop and philosopher.
Bernard, St. (1091-1153).
Beza, Theodore (1519-1605), Genevese reformer.
Björnson, Björnstjerne (1832-), Norwegian poet, novelist, and dramatist.
Bismarck-Schoenhausen, Otto Edward Leopold, Prince von (1813-1898), German general and chancellor.
Black, William (1804-1898), English novelist.

Blackmore, Richard Doddridge (1825-1900), English lawyer and author.
Blackstone, Sir William (1723-1780), English jurist.
Blücher, Gebhard Leberecht von, Prince of Wahlstadt (1742-1819), Prussian general.
Boccaccio, Giovanni (1313-1375), Italian author.
Boleyn, Anne (1507-1536), second wife of Henry VIII of England.
Bolivar, Simon (1783-1830), Venezuelan statesman and general.
Bonaparte, Napoleon (1769-1821), French Emperor.
Bonheur, Rosalie Marie (1822-1899), French painter.
Boniface, name assumed by nine of the Popes.
Boniface, St. (Winifred) (680-755), Papal legate and martyr.
Boone, Daniel (1735-1820), American pioneer.
Booth, Edwin (1833-1893), American actor.
Booth, John Wilkes (1839-1865), American actor.
Borgia, Cesare (1478-1507), Tyrant of Romagna.
Borgia, Lucrezia (1480-1520), Duchess of Ferrara.
Bossuet, Jacques Bénigne (1627-1743), French preacher and bishop.
Boswell, James (1740-1822), English biographer of Dr. Johnson.
Botticelli, Sandro (1447-1515), Italian painter.
Bourbon, name of royal dynasty in France and Spain.
Bourget, Paul (1852-), French novelist and critic.
Bourrienne, Louis Antoine Fauvelet de (1769-1834), biographer of Napoleon I.
Boyesen, Hjalmar Hjorth (1848-1895), Norwegian-American novelist and poet.
Bozzaris, Marco (17 -1823), Greek patriot.
Bradford, William (1590-1657), American pioneer and historian.
Bragg, Braxton (1817-1876), Confederate general.
Bright, John (1811-1889), English politician.
Brontë, Charlotte (1816-1855), English novelist.
Brooks, Phillips (1835-1893), American bishop and writer.
Brougham, Henry, Lord Brougham and Vaux (1778-1868), English orator and reformer.
Brown, John, Captain (1800-1859), abolitionist.
Browne, Charles Farrar (Artemus Ward) (1836-1867), American humorist.
Browning, Elizabeth Barrett (1809-1861), English poetess.
Browning, Robert (1812-1889), English poet.
Bruce, name of Scotch family of historic fame.
Brutus, Marcus Junius (85-42 B.C.), Roman politician.
Bryant, William Cullen (1794-1878), American poet.
Bryce, James (1838-), English historian and politician.
Buchanan, James (1791-1868), 15th President of the United States.
Buffon, George Louis Leclerc, Comte de (1707-1788), French naturalist.
Bulwer-Lytton (1803-73), English novelist.
Bülow, Friedrich Wilhelm von (1755-1818), Prussian general.
Bunsen, Christian Karl Josias, Baron (1791-1860), German statesman and author.
Bunyan, John (1628-1688), English writer.
Buonarotti, Michelangelo (1475-1564), Italian sculptor and painter.
Burdett-Coutts, Right Hon. Angela Georgina, Baroness (1814-), English philanthropist.
Burke, Edmund (1730-1797), English philosopher and politician.
Burne-Jones, Sir Edward (1833-1898), English painter.
Burns, Robert (1759-1796), Scotch poet.
Burr, Aaron (1756-1836), American politician.
Burritt, Elihu (1811-1879), American linguist.
Burroughs, John (1837-), American essayist.
Butler, Benjamin Franklin (1818-1893), American general.
Byron, George Gordon, Lord (1788-1824), English poet.

C

Cable, George Washington (1844-), American novelist.
Cabot, Giovanni (-1498), Venetian navigator and discoverer.
Cabot, Sebastian (1477-1557), Venetian navigator and discoverer.
Cæsar, Caius Julius (100-44 B.C.), Roman general and dictator.
Calhoun, John Caldwell (1782-1850), American statesman.
Caligula (12-41), Roman emperor.
Calvert, George, Lord Baltimore (1580-1632), founder of Maryland.
Calvin, John (1509-1564), Protestant reformer.
Cambyses, name of several kings of the Medes and Persians.
Camoens, Luis de (1524-1580), Portuguese poet.
Campbell, Sir Colin, Lord Clyde (1792-1863), British general.
Campbell, Thomas (1777-1844), English poet.
Canning, George (1770-1827), English orator and statesman.
Canova, Antonio (1757-1822), Italian sculptor.
Carlyle, Thomas (1795-1881), English essayist and historian.
Carnot, Marie François Sadi (1837-1894), French politician.
Catherine, name of two empresses of Russia.
Catherine de Medici (1519-1589), Queen of Henry II of France.
Catherine of Aragon (1485-1536), first wife of Henry VIII of England.
Catherine Parr (1513-1547), sixth wife of Henry VIII of England.
Catiline (108-62 B.C.), Roman politician.
Cato, Marcus Porcius (234-149 B.C.), Roman orator.
Cavour, Count Camilla Benso di (1810-1861), Italian statesman.
Caxton, William (1422-1491), introduced printing into England.
Cecil, William, Lord Burleigh (1520-1598), English statesman.
Cecilia, St. (-230), Christian martyr.
Cellini, Benvenuto (1500-1572), Italian gold worker and sculptor.
Cervantes, Saavedra Miguel de (1547-1616), Spanish writer.
Channing, William Ellery, D.D. (1780-1842), American preacher.
Charlemagne (768-814), king of the Franks and Roman emperor.
Charles, name of several kings of England and France and Sweden, and emperors of Germany.
Chateaubriand, Francis Auguste, Vicomte de (1769-1848), French author.
Chatham, William Pitt, Earl of (1708-1778), English orator and statesman.
Chatterton, Thomas (1752-1770), English poet.
Chaucer, Geoffrey (1340-1400), English poet.
Chesterfield, Philip Dormer Stanhope, Earl of (1694-1773), English statesman and author.

Choate, Rufus (1799-1859), American lawyer and orator.
Choiseul-Amboise, Etienne François (1719-1785), French statesman.
Chopin, Frederic (1810-1849), Polish pianist and musical composer.
Christian, name of several Swedish kings.
Chrysostom, John (347-407), orator, bishop, and reformer.
Churchill, Randolph Henry Spencer (1849-1895), English politician.
Cibber, Colley (1617-1757), English poet-laureate.
Cicero, Marcus Tullius (106-43 B.C.), Roman orator.
Cincinnatus, Lucius Quinctius (abt. 400 B.C.), Roman consul.
Claude Lorrain (Claude Gelée) (1600-1682), French artist.
Clay, Henry, (1777-1852), American statesman.
Clemens, Samuel Langhorne (Mark Twain) (1835-), American humorist.
Clement, name assumed by fourteen Popes.
Clement of Alexandria (A.D. 190), father of the Church.
Cleopatra (69-30 B.C.), last queen of Egypt.
Clive, Robert, Lord, Baron of Plassey (1725-1774), English general and statesman.
Cobden, Richard (1804-1865), English politician.
Coleridge, Samuel Taylor (1772-1834), English philosopher.
Coligni, Gaspard de (1517-1572), French admiral and general.
Collins, William Wilkie (1825-1889), English novelist.
Colonna, Vittoria (1490-1547), Italian poet.
Columbus, Christopher (1436-1502), Italian navigator and discoverer.
Commodus, Lucius Aurelius (161-192), Roman emperor.
Comte, Auguste (1795-1857), French philosopher.
Condé, a family celebrated in French history.
Confucius (551-479 B.C.), Chinese sage.
Constantine, 272-323, Emperor of the West.
Cook, Captain James (1728-1779), English navigator.
Cooper, James Fenimore (1789-1851), American novelist.
Cooper, Peter (1791-1883), American manufacturer and philanthropist.
Copernicus, Nicolas (1473-1543), Prussian astronomer.
Copley, John Singleton (1737-1815), American painter.
Coppée, Francis Eduard Joachim (1842-), French writer.
Coquelin, Benoit Constant (1841-), French actor.
Corneille, Pierre (1606-1684), French tragedian and poet.
Cornwallis, Charles, Marquis (1738-1805), English general and statesman.
Correggio, Antonio Allegri (1494-1534), Italian painter.
Cortes, Hernando (1485-1547), Spanish soldier, conqueror of Mexico.
Cotton, John (1585-1652), American preacher.
Cousin, Victor (1792-1867), French statesman and writer.
Coverdale, Miles (1488-1568), first translator of the Bible into English.
Cowper, William (1731-1800), English poet.
Crabbe, George (1754-1832), English poet.
Cranmer, Thomas (1489-1556), English reformer.
Crichton, James (1551-1573), Scottish scholar and adventurer.
Crœsus (500 B.C.), King of Lydia.
Cromwell, Oliver (1599-1658), English general.
Curtis, George William (1824-92), American journalist and orator.
Curzon, George Nathaniel (1859-), English statesman.
Custer, George Armstrong (1839-1876), American soldier.
Cuvier, George Crétien Leopold Dagobert, Baron (1769-1832), French naturalist.

D

Daguerre, Louis Jacques Mandé (1789-1851), French painter and inventor.
Damien, de Venster, Joseph (1840-1889), missionary to lepers.
Danté, Alighieri (1265-1321), Italian poet.
Danton, Georges-Jacques (1759-1794), French revolutionist.
Darius, name of several Persian kings.
Darnley, Lord (Henry Stuart) (1541-1567), second husband Mary Queen of Scots.
Darwin, Charles, F.R.S. (1809-1882), English naturalist.
Daubigny, Charles François (1817-1878), French painter.
David, Jacques Louis (1748-1825), French painter.
Davis, Jefferson (1808-1868), President of Confederate States.
Davy, Sir Humphry (1778-1829), English scientist.
Decatur, Stephen (1779-1820), American naval officer.
Defoe, Daniel (1661-1731), English novelist.
Delacroix, Ferdinand Victor Eugène (1799-1863), French painter.
Demosthenes (382-322 B.C.), Greek orator.
De Quincey, Thomas (1785-1859), English writer.
Descartes, René (1596-1650), French philosopher.
Dewey, George (1837-), American admiral.
Dickens, Charles (1812-1870), English novelist.
Diderot, Denis (1713-1784), French encyclopedist and philosopher.
Diocletian, Valerius (245-313), Roman emperor.
Diogenes (412-323 B.C.), cynic philosopher.
Diogenes, Laërtius (2d century A.D.), Greek biographer.
Disraeli, Benjamin, Earl of Beaconsfield (1805-1881), author and statesman.
Disraeli, Isaac, D.C.L. (1766-1848), English author.
Donatello, Donato di Betto Bardo (1383-1466), Italian sculptor.
Doré, Paul Gustave (1833-1883), French painter.
Douglass, Frederick (1817-1895), American orator and journalist.
Dow, Gerard (1613-1675), Dutch genre painter.
Draco (600 B.C.), Athenian law-giver.
Drake, Sir Francis (1539-1595), English admiral.
Dryden, John (1631-1700), English poet.
Dudley, Joseph (1647-1720), American politician.
Dudley, Robert, Earl of Leicester (1533-1588), English courtier.
Dudley, Thomas (1576-1652), colonial politician, Governor of Massachusetts.
Dumas, Alexandre (1803-1870), French novelist.
Dumas, Alexandre, fils (1824-1895), French novelist.
Duns Scotus, Johannes (1265-1308), scholar and philosopher.
Dunstan, St. (925-988), English bishop.
Dupont, Samuel Francis (1803-1865), American admiral.
Duquesne, Abraham, Marquis (1610-1688), French naval officer.

Dürer, Albrecht (1471-1528), German painter.
Dwight, Timothy (1752-1817), American theologian.
Dyck, Sir Anthony van (1599-1641), Flemish painter.

E

Ebers, Georg (1837-1898), German Egyptologist and novelist.
Edward, name of several kings of England.
Edwards, Jonathan (1703-1801), American theologian.
Eiffel, Alexandre Gustave (1832-), French engineer.
Elizabeth (1533-1603), Queen of England.
Eliot, George (Marian Evans) (1820-1880), English novelist.
Emerson, Ralph Waldo (1803-1882), American philosopher.
Endicott, John (1589-1665), Governor of Massachusetts colony.
Epaminondas (414-362 B.C.), Theban general.
Epictetus (A.D. 50), Greek philosopher.
Epicurus (341-270 B.C.), Greek philosopher.
Erasmus, Desiderius (1467-1536), Dutch humanist and reformer.
Erastus, Thomas (1524-1583), Swiss theologian.
Ericsson, Joh (1803-1889), Swedish-American engineer and inventor.
Euclid (300 B.C.), Greek mathematician.
Eugenius, name assumed by four Popes.
Euripides (480-406 B.C.), Greek tragedian.
Eusebius (264-340), ecclesiastical historian.
Evans, Marian. See Eliot, George.
Evelyn, John (1620-1706), English writer.
Everett, Edward (1794-1865), American statesman and orator.

F

Fahrenheit, Gabriel Daniel, (1686-1736), German scientist.
Faraday, Michael, D.C.L. (1791-1867), English scientist.
Farragut, David Glasgow (1801-1870), Vice-Admiral of American navy.
Fawkes, Guy (1570-1606), English conspirator.
Feïix, name assumed by four Popes.
Fénelon (François de Salignac de la Mothe), (1651-1715), French prelate, orator, and writer.
Ferdinand, name of several emperors of Germany and Austria and kings of Spain and Sicily.
Ferrier, James Frederick (1808-1864), Scottish metaphysician.
Feuillet, Octâve (1821-1890), French novelist and dramatist.
Fichte, Johann Gottlieb (1762-1814), German philosopher.
Field, Cyrus West (1819-1892), founder of Atlantic Cable Company.
Fielding, Henry (1707-1754), English novelist.
Fillmore, Millard (1800-1874), President of United States.
Firdusi, Abul-Rasim Mausur (915-940), Persian poet.
Fiske, John (1842-1902), American historical writer.
Flaxman, John (1755-1826), English sculptor.
Fouché, Joseph, Duke of Otranto (1763-1820), French revolutionist.
Fourrier, Jean Baptiste Joseph, Baron (1768-1830), French mathematician.
Fox, Charles James (1749-1806), English statesman.
Fox, George (1624-1691), originator of Society of Friends.
Foxe, John (1517-1587), English martyrologist.
Fra Diavolo (Michael Pezzo) (1760-1806), Italian brigand and renegade monk.
Francis, name of several kings of France and emperors of Germany.
Francis de Sales, St. (1567-1622), bishop and writer.
Francis of Assisi, St. (1182-1226), founder of Franciscan order.
Franklin, Benjamin (1706-1790), American statesman and philosopher.
Franklin, Sir John (1786-1847), English Arctic explorer.
Fremont, John Charles (1813-1890), American traveler and explorer.
Fröbel, Friedrich (1782-1852), founder of kindergarten system.
Frobisher, Sir Martin (?1535-1594), English navigator.
Froissart, Jean (1337-1410), French poet and historian.
Froude, James Anthony (1818-1894), English historian.
Fry, Elizabeth (1780-1845), English female philanthropist and preacher.
Fuller, Sarah Margaret, Marchioness Ossoli (1810-1850), American writer.
Fulton, Robert (1765-1815), American engineer and inventor.

G

Gage, Thomas (1721-1787), British general.
Gainsborough, Thomas (1727-1788), English painter.
Galba, Servius Sulpicus (3 B.C.—A.D. 67), Roman emperor.
Galen (130-201), Greek physician.
Galilei, Galileo (1564-1642), Italian physicist and astronomer.
Gama, Dom Vasco da (1469-1525), Portuguese navigator.
Gambetta, Léon (1838-1882), French lawyer and statesman.
Garibaldi, Giuseppi (1807-1882), Italian statesman.
Garrick, David (1716-1779), English actor.
Garrison, William Lloyd (1805-1879), American abolitionist.
Gates, Horatio (1728-1806), American general.
Gautier, Théophile (1811-1872), French poet, novelist, and critic.
Gay, John (1688-1732), English poet.
Genghis Khan (1155-1227), Mongolian conqueror.
George, name of several kings of England.
Gérome, Jean-Léon (1824-), French painter.
Gibbon, Edward (1737-1791), English historian.
Giotto (Ambrogiotto Bordone), (1276-1336), Italian painter.
Gladstone, Right Hon. William Ewart (1809-1900), English statesman.
Gluck, Christoph Willibald von (1714-1787), German musical composer.
Godfrey de Bouillon (1061-1100), English conqueror and protector of Jerusalem.
Goethe, Johann Wolfgang von (1749-1832), German poet.
Goldschmidt, Madame (Jenny Lind), (1821-1887), Swedish singer.
Goldsmith, Oliver (1728-1774), English writer.
Gonzales, Manuel (1833-1893), Mexican general and statesman.
Gough, John B. (1817-1886), American temperance lecturer.

Gounod, Charles François (1818-1893), musical composer.
Grant, Ulysses Simpson (1822-1885), eighteenth President of the United States and general in the Civil War.
Gray, Asa (1810-1888), American botanist.
Gray, Thomas (1716-1771), English poet.
Greeley, Horace (1811-1872), American journalist.
Greene, Nathaniel (1742-1786), American Revolutionary general.
Gregory, name assumed by sixteen Popes.
Grenze, Jean Baptiste (1725-1805), French painter.
Grey, Lady Jane (1537-1553), Queen of England for ten days.
Grimm, Jacob Ludwig (1785-1863), German writer.
Grimm, Wilhelm Karl (1786-1859), German writer.
Grote, George (1794-1871), English politician, historian, and philosopher.
Grotius, Hugo (1583-1645), Dutch statesman and scholar.
Guido, Reni (1575-1642), Italian painter.
Guise, name of family famous in French history.
Guizot, François Pierre Guillaume (1787-1874), French statesman and historian.
Gustavus, name of several kings of Sweden.
Gutenberg, Johannes (Gensfleisch), (1400-1460), inventor of movable type.

H

Hadrian, Publius Ælius Hadrianus (117-138), Roman emperor.
Hahnemann, Samuel (1755-1843), German physician.
Hale, Edward Everett (1822-), American author, editor, and preacher.
Hale, Nathan (1755-1776), American patriot.
Hall, Charles Francis (1821-1871), American Arctic explorer.
Hallam, Henry (1777-1859), English historian and critic.
Hamilcar, name of several Carthaginian generals.
Hamilton, Alexander (1757-1804), American statesman.
Hampden, John (1594-1643), English patriot.
Händel, George Frederick (1685-1759), German musical composer.
Hannibal, name of several Carthaginian generals.
Harrison, Benjamin (1833-1901), twenty-third President of the United States.
Harrison, William Henry (1773-1841), ninth President of the United States.
Harold, name of two kings of England.
Haroun al Raschid (786-809), Abbaside Calif, hero of Arabian Nights.
Harte, Francis Bret (1839-1902), American poet and novelist.
Harvey, William (1578-1657), physician and discoverer of circulation of blood.
Hasdrubal, name of several Carthaginian generals.
Hastings, Warren (1732-1818), governor-general of India.
Hawkins, Sir John (1520-1595), English navigator.
Hawthorne, Nathaniel (1804-1864), American writer.
Haydn, Joseph (1732-1809), German musical composer.
Hayes, Isaac Israel (1832-1881), American Arctic explorer.
Hayes, Rutherford Birchard (1822-1893), nineteenth President of the United States.
Hazlitt, William (1778-1830), English essayist and critic.
Heber, Reginald (1783-1826), English poet and bishop.
Hegel, George Wilhelm Friedrich (1770-1831), German philosopher.
Heine, Heinrich (1799-1856), German poet and wit.
Henry, name of several kings of England and France and emperors of Germany.
Henry, Patrick (1737-1799), American orator and patriot.
Herbert, George (1593-1632), English poet and clergyman.
Herder, Johann Gottfried von (1744-1803), German philosopher.
Herodotus (484-408 B.C.), Greek historian.
Herrick, Robert (1591-1674), English poet.
Herschel, Sir William (1738-1822), English astronomer.
Hesiod (7th century B.C.), Greek poet.
Heyse, Johann Ludwig Paul (1830-), German novelist and poet.
Higginson, Thomas Wentworth (1823-), American author.
Hippocrates (460-354 B.C.), Greek physician.
Hogarth, William (1697-1764), English painter and engraver.
Holbein, Hans (1450-1526), German painter.
Holmes, Oliver Wendell (1809-1894), American poet, novelist, and essayist.
Homer (850 B.C.), Greek poet.
Honorius, name assumed by four Popes.
Horace (68-8 B.C.), Roman poet.
Hord, Thomas (1798-1845), English poet.
Howells, William Dean (1837-), American novelist and poet.
Hudson, Henry (unknown), English navigator.
Hugo, Victor Marie, Vicomte (1802-1885), French writer.
Humboldt, Friedrich Heinrich Alexander, Baron von (1769-1859), Prussian naturalist.
Hume, David (1711-1776), English philosopher and historian.
Hunt, James Henry Leigh (1784-1859), English poet and essayist.
Hunt, William Holman (1827-), English painter.
Huss, John (1373-1415), Bohemian reformer and martyr.
Hutchinson, Anne (1590-1643), American religious enthusiast.
Hutchinson, Thomas (1711-1780), American magistrate and historian.
Huxley, Thomas Henry (1825-1895), English naturalist.

I

Ibsen, Henrik (1828-), Norwegian dramatic poet.
Inglis, Sir John Eardley Wilmot (1814-1862), defender of Lucknow.
Inness, George (1825-1894), American landscape painter.
Innocent, name assumed by thirteen Popes.
Irving, Edward (1792-1834), Scotch preacher.
Irving, Washington (1783-1859), American writer.
Isabella (1451-1504), Queen of Spain, wife of Ferdinand.
Ivan, name of a number of Russian Czars.

J

Jackson, Andrew, General (1767-1846), seventh President of the United States.
Jackson, Thomas Jonathan (Stonewall Jackson), (1824-1863), Confederate general.

James, name of several kings of England and Scotland.
James, George Payne Rainsford (1801-1860), English novelist.
James, Henry (1843-), American novelist.
Jay, John (1745-1829), American jurist and statesman.
Jefferson, Thomas (1743-1826), third President of the United States.
Jeffreys, George, Baron (1648-1689) English judge.
Joan of Arc (Jeanne D'Arc or Darc), (1412-1431), French national heroine.
Johnson, Andrew (1808-1875), seventeenth President of the United States.
Johnson, Samuel (1709-1784), English writer and lexicographer.
Jones, John Paul (1747-1792), Scottish-American naval officer.
Jonson, Ben (1573-1637), English dramatist.
Josephine, Marie Rose (1763-1814), Empress of French, wife of Napoleon.
Josephus, Flavius (37-90), Jewish historian.
Jugurtha (-104 B.C.), King of Numidia.
Julian (The Apostate), (331-363), Roman emperor.
Julius, name assumed by three Popes.
Justinius, name of two emperors of the East.
Justinus (118-165), "Father of the Church."

K

Kane, Elisha Kent, M.D. (1820-1857), American Arctic explorer.
Kant, Immanuel (1724-1804), German philosopher.
Kaulbach, Wilhelm von (1805-1874), German painter.
Kean, Edmund (1767-1833), English actor.
Keats, John (1796-1821), English poet.
Keble, John (1792-1866), English clergyman and poet.
Kellogg, Clara Louise (1842-), American opera singer.
Kemble, Frances Anne (1809-1893), Anglo-American actress, Shakespearian reader, and author.
Kempis, Thomas à (1379-1471), Prussian monk and writer.
Kepler, Johann (1571-1630), German astronomer.
Kidd, Captain William (-1701), notorious pirate.
Kitchener, Horatio Herbert (1850-), British general.
Klopstock, Friedrich Gottlieb (1724-1803), German poet.
Knox, John (1505-1572), Scottish reformer.
Kosciusko, Tadeusz (1746-1817), Polish general and patriot.
Kossuth, Lajos (1802-1894), Hungarian patriot and orator.
Kreutzer, Rodolphe (1766-1831), French violinist and composer.

L

Lafayette, Marie Jean Paul Roch Yoes Gilbert Motier, Marquis de (1757-1834), French general in American army.
Lafontaine, Jean de (1621-1695), French fabulist.
Lamarck, Jean Baptiste Pierre Antoine de Monnet, Chevalier de (1744-1829), French naturalist.
Lamartine, Alphonse (1792-1869), French writer.
Lamb, Charles (1775-1834), English poet and essayist.
Landseer, Sir Edwin Henry, R.A. (1802-1873), English painter.
Laplace, Pierre Simon, Marquis de (1749-1827), French mathematician and astronomer.
La Salle, Robert Cavalier, Sieur de (1643-1687), French explorer.
Latimer, Hugh (1490-1555), English prelate and reformer.
Laud, William (1573-1644), English bishop.
Lavater, Johann Kasper (1741-1801), French physiognomist.
Lavoisier, Antoine Laurent (1743-1794), French chemist.
Lawrence, Sir Thomas (1796-1830), English painter.
Layard, Austen Henry (1817-1894), English traveler, politician, and writer.
Le Brun, Marie Anne Elizabeth Viglée (1755-1842), French painter.
Lecky, William Edward Hartpole (1838-), British historian.
Le Conte, John Lawrence (1825-1883), American naturalist.
Lee, Robert Edward (1807-1870), general in Confederate army.
Leech, John (1817-1864), English caricaturist.
Legendre, Adrien Marie (1752-1833), French mathematician.
Leicester, Robert Dudley, Earl of (1531-1588), English courtier.
Leighton, Frederick, Lord (1830-1896), English painter.
Leo, name assumed by thirteen Popes.
Leonardo da Vinci (1452-1519), Italian painter.
Leonidas (-480 B.C.), King of Sparta.
Lesseps, Vicomte Ferdinand de (1805-1894), French engineer and diplomatist.
Lessing, Gotthoid Ephraim (1729-1781), German dramatist.
Lincoln, Abraham (1809-1865), sixteenth President of the United States.
Li Hung Chang (1823-1901), Chinese statesman.
Liszt, Franz (1811-1886), Hungarian musical composer.
Livingstone, David (1813-1873), African explorer and missionary.
Logan, James (1674-1751), American colonial politician.
Longfellow, Henry Wadsworth (1807-1882), American poet.
Lowell, James Russell (1819-1891), American poet, essayist, scholar, and diplomatist.
Loyola, Ignatius de (Inigo Lopez de Recalde), (1491-1556), founder of Society of Jesus.
Lubbock, Sir John (1834-), English naturalist.
Luther, Martin (1483-1546), German reformer.
Lyell, Sir Charles (1797-1875), British geologist.
Lytton, Edward George Earle Lytton Bulwer, first Baron Lytton (1803-1873), English novelist, poet, dramatist, politician, and orator.
Lytton, Edward Robert Lytton Bulwer, first Earl of Lytton (Owen Meredith), (1831-1891), English diplomatist, politician, and poet.

M

Macaulay, Thomas Babington (1800-1859), English historian and essayist.
Macchiavelli, Niccoli di Bernadino del (1499-1527), Italian diplomatist.
Mackenzie, Sir Alexander (-1820), Scottish explorer.
Macready, William Charles (1793-1873), English actor.
Madison, James (1751-1836), fourth President of the United States.

Maeterlinck, Maurice (1864-), Belgian poet and dramatist.
Marat, Jean Paul (1743-93), French revolutionist.
Marcus Aurelius Antonius (121-180), Roman emperor.
Maria Louisa (1791-1847), second wife of Napoleon I, Austrian princess.
Maria Théresa (1717-80), Empress of Austria, mother of Marie Antoinette.
Marie Antoinette de Lorraine, Josephine Jeanne (1755-93), wife of Louis XVI of France.
Marius, Caius (157-86 B.C.), Roman general.
Marlowe, Christopher (1565-93), English dramatist.
Marquette, Jacques (1637-75), French missionary and explorer.
Mather, Cotton (1663-1728), American theologian.
Mather, Increase (1639-1723), American theologian.
Maupassant, Henri Réné Albert Guy de (1850-93), French novelist.
Maurice, Prince of Orange, Count of Nassau (1567-1625), Dutch general.
Mazeppa, Ivan Stepanovitch (1644-1709), Cossack chief.
Mazzini, Giuseppe (1805-72), Italian patriot and revolutionist.
McClellan, George B. (1826-85), general in American army.
McKinley, William (1843-1901), twenty-fifth President of the United States.
Medici, name of famous Italian family.
Meissonier, Jean Louis Ernest (1811-91), French painter.
Melanchthon, Philip (1497-1560), German reformer.
Mello, Custodio José de (1845-), Brazilian naval officer and revolutionist.
Mendelssohn-Bartholdy, Felix (1809-47), German musical composer.
Menes (b. 5702 B.C.), traditional first king of united Egypt.
Mesmer, Friedrich Anton (1733-1815), German physician, originator of mesmerism.
Metternich-Winneburg, Prince Clemens Wenzel Nepomuk Lothar von (1773-1859), Austrian statesman and diplomatist.
Michelangelo (Buonarotti), (1475-1564), Italian sculptor and painter.
Michelet, Jules (1798-1874), French historian.
Mill, John Stuart (1806-73), English philosopher and economist.
Millais, John (1829-96), English painter.
Miller, Hugh (1802-56), Scotch geologist.
Millet, Jean François (1814-75), French painter.
Miltiades (500 B.C.), Athenian general.
Milton, John (1608-74), English poet.
Mirabeau, Gabriel Honoré Riquetté, Comte de (1749-91), orator of French Revolution.
Miramon, Miguel (1832-67), Mexican general.
Mithridates (The Great), (132-63 B.C.), King of Pontus.
Mohammed (570-632), founder of Islam.
Molière, Jean Baptiste (Poquelin), (1622-73), French dramatist.
Moltke, Count Helmuth Karl Bernhard von (1800-91), Prussian field-marshal.
Monroe, James (1758-1831), fifth President of the United States.
Montaigne, Michel Eyquem de (1533-92), French philosopher.
Montcalm Gezan de Saint Véran, Louis Joseph, Marquis de (1712-59), French general.
Montezuma II or Xocoyotzin (1470?-1520), Aztec war-chief or emperor.
Moore, Thomas (1779-1852), English poet.
Morris, Gouverneur (1752-1816), American statesman.
Morse, Samuel Finley Breese (1791-1872), American painter, inventor of telegraph.
Mozart, Johann Chrysostom Wolfgang Gottlieb (1756-91), German composer.
Muir, John (1836-), American naturalist, explorer, and writer.
Murat, Joachim (1771-1815), French field-marshal, King of Naples.
Münchausen, Karl Friedrich, Baron (1720-97), German soldier and raconteur.
Murillo, Bartolome Estéban (1618-82), Spanish painter.
Musset, Louis Charles Alfred de (1810-57), French poet and dramatist.
Mustapha, name of several Turkish Sultans.

N

Nansen, Fridtjof (1861-), Norwegian Arctic explorer.
Napier, Sir Charles James (1782-1853), English general.
Napoleon Bonaparte (1769-1821), first emperor of the French.
Nebuchadnezzar (605-561 B.C.), King of Babylon.
Nelson, Horatio (1758-1805), English admiral.
Nero, Claudius Cæsar Drusus Germanicus (37-68), Roman emperor.
Newman, John Henry (1801-90), English cardinal and theologian.
Newton, Sir Isaac (1642-1727), English scientist and mathematician.
Ney, Michel (1769-1815), French marshal, Prince of the Moskwa.
Nightingale, Florence (1820-), English philanthropist.

O

O'Connell, Daniel (1775-1847), Irish agitator and orator.
O'Donoju, Juan (1755-1821), last Spanish ruler in Mexico.
Offenbach, Jacques (1819-80), German composer.
Ohlenschlager, Adam Gottlieb (1779-1850), Danish poet and dramatist.
Oliphant, Margaret (née Wilson), (1820-97), English novelist.
Omar Khayyam (d. A.D. 1122), Persian astronomer and poet.
O'Meara, Barry Edward (1786-1836), Irish surgeon and biographer of Napoleon I.
Otho or Otto, name of several emperors of Germany.
Otis, James (1725-83), American patriot and orator.
Ovid (Publius Ovidius Naso), (43 B.C.—A.D. 18), Latin poet.
Oxenstierna, Axel, Count (1583-1654), Swedish statesman.

P

Paderewski, Ignace Jan (1860-), Polish pianist.
Paez, José Antonio (1791-1873), Venezuelan politician.
Paganini, Nicolo (1784-1840), Italian violinist.
Paine, Thomas (1737-1809), American political writer.

Palissy, Bernard (1509-89), French potter and enameler.
Parkman, Francis (1823-93), American historian.
Parnell, Charles Stewart (1846-91), Irish agitator.
Parrhasius (400 B.C.), Greek painter.
Parry, Sir William Edward (1790-1855), English admiral and Arctic explorer.
Pascal, Blaise (1623-62), French philosopher.
Patti, Nicolini, Adelina (Baroness Cedarstrom), (1843-), soprano singer.
Peary, Robert Edwin (1854-), American Arctic explorer.
Pedro I, Dom Antonio Pedro de Alcantara Bourbon (1798-1834), first emperor of Brazil.
Pedro II, Dom Pedro de Alcantara (1825-91), second emperor of Brazil.
Peel, Sir Robert (1788-1850), English statesman.
Penn, William (1644-1718), founder of Pennsylvania.
Pepin (d. A.D. 768), King of the Franks.
Pepys, Samuel (1633-1703), English politician and writer.
Périer, Jean Paul Pierre Casimir (1847-), French President.
Perry, Oliver Hazard (1785-1819), American naval officer.
Peter I, The Great (1672-1724), Czar of Russia.
Petrarca, Francesco (1304-1374), Italian poet.
Phidias (500-430 B.C.), Greek sculptor.
Philip, name of several kings of Macedon and Spain.
Phillips, Wendell (1811-84), American orator and abolitionist.
Pichegru, Charles (1761-1804), French patriot and general.
Pickett, George Edward (1825-75), Confederate general.
Pierce, Franklin (1804-69), fourteenth President of the United States.
Pindar (522-443 B.C.), Greek poet.
Pinto, Fernao Mendez (1509-82), Portuguese explorer of America.
Pisistratus (605-527 B.C.), tyrant of Athens.
Pitt, William (1708-78), English statesman and orator.
Pitt, William (1759-1806), English statesman; Prime Minister.
Pius, name assumed by ten Popes.
Pizarro, Francisco (1475-1541), Spanish soldier, conqueror of Peru.
Plato (427-347 B.C.), Greek philosopher.
Pliny (Gaius Plinius Cæcilius Secundus), (62-110), Roman writer.
Pliny (Gaius Plinius Secundus), (23-79), Roman naturalist.
Plutarch (42-120 abt.), Greek biographer.
Poe, Edgar Allan (1809-49), American poet and writer.
Polk, James Knox (1795-1849), eleventh President of the United States.
Polo, Marco (1254-1324), Venetian traveler.
Polybius (204-122 B.C.), Greek historian.
Polycarp (1st century A.D.), bishop of Smyrna and Christian martyr.
Polycletus (5th century B.C.), Greek sculptor and architect.
Pompey, Cneius Pompeius Magnus (106-48 B.C.), Roman general.
Ponce de Léon, Juan (1460-1521), Spanish soldier, discoverer of Florida.
Pope, Alexander (1688-1717), English poet.
Porter, David Dixon (1813-91), American admiral.
Praxiteles (4th century B.C.), Greek sculptor.
Prescott, William Hickling (1796-1859), American historian.
Proudhon, Pierre Joseph (1809-65), French socialist.
Ptolemy, name of several rulers of the Greek dynasty in Egypt.
Pythagoras, (582-500 B.C.), Grecian philosopher.
Puvis de Chavannes (1824-98), French decorative painter.

Q

Quételet, Lambert Adolphe Jacques (1796-1874), Belgian mathematician and astronomer.
Quincy, Josiah (1772-1864), American lawyer, orator, and writer.
Quinet, Edgar (1803-75), French philosopher, historian, poet, and politician.

R

Rabelais, François (1483-1553), French humorist.
Racine, Jean (1639-99), French dramatist.
Raleigh, Sir Walter (1552-1618), English courtier and historian.
Rameses I (1400 B.C.), founder of nineteenth dynasty of Egyptian kings.
Rameses II (1300 B.C.), one of the most famous of Egyptian kings.
Randolph, Peyton (1723-75), president of first Continental Congress.
Raphael, Sanzio (1483-1520), Italian painter.
Réaumur, René Antoine Ferchault (1683-1757), French physicist.
Rembrandt Hermanszoon (Rembrant van Rhyn) (1607-69), Dutch painter.
Renan, Joseph Ernest (1823-92), French theologian and Orientalist.
Reszke, Edouard de (1856-), Polish bass singer.
Reszke, Jean de (1853-), Polish tenor singer.
Revere, Paul (1735-1818), American patriot.
Reynolds, Sir Joshua (1723-92), English painter.
Richardson, Samuel (1689-1761), "founder of English novel."
Richelieu, Armand Jean du Plessis, Cardinal, Duc de (1585-1642), French cardinal, statesman, and writer.
Richter, Jean Paul Friedrich (1763-1825), German scholar.
Riedesel, Baron Friedrich Adolph von (1738-1800), German commander in American Revolutionary army.
Rienzi, Cola di (1313-54), Italian reformer, "Last of the Tribunes."
Rittenhouse, David (1732-1803), American astronomer.
Ritter, Frédéric Louis (1834-91), American composer, conductor, and musical writer.
Robbia, Lucca della, Luca di Simone di Marco della Robbia (1400-82), Italian sculptor.
Robert, name of several kings of France and Scotland.
Roberts, Sir Frederick Sleigh, Baron (1832-), British general.
Robespierre, Maximilian Marie Isidore de (1758-94), French revolutionist.
Rodin, Auguste (1840-), French sculptor.
Roebling, John Augustus (1806-69), American civil engineer.
Röntgen, Wilhelm Konrad (1845-), German scientist, discoverer of X-rays.
Roosevelt, Theodore (1858-), twenty-sixth President of the United States.
Rosas, Juan Manuel de (1793-1877), dictator of Buenos Ayres.

Rosecrans, William Starke (1819-98), American general.
Rossetti, Dante Gabriel (1828-82), Preraphaelite painter and poet.
Rossini, Gioacchino Antonio (1792-1868), Italian composer.
Rothschild, Meyer Amschel, Baron (1743-1812), German-Jewish banker.
Rousseau, Jean Jacques (1712-78), French philosophical writer.
Rousseau, Piérre Etienne Théodore (1812-67), French painter.
Rubens, Peter Paul (1577-1640), German painter.
Rubinstein, Anton (1829-1894), Russian pianist and composer.
Rush, Benjamin (1745-1813), American physician and statesman.
Ruskin, John (1819-1900), English writer on architecture and art.
Ruyter, Michael Adrianszoon van (1607-76), Dutch admiral.

S

Sachs, Hans (1494-1576), German poet.
Sackville, Thomas, Earl of Dorset (1536-1608), poet and statesman.
Sadi, Sheikh Muslih Addin (1184-1291), Persian poet.
Saint-Saens, Charles Camille (1835-), French composer and pianist.
Saladin (1137-93), famous Sultan of Egypt and Syria.
Salisbury, 3d Marquis of, Robert Arthur Talbot Gascoyne Cecil (1830-1903), English Conservative statesman.
Sallust, Caius Crispus (86-34 B.C.), Roman historian.
Sampson, William Thomas (1840-1902), American naval officer.
Sand, George (Armadine Lucile Aurore Dupin, Baroness Dudevant), (1804-76), French novelist.
Santa Anna, Antonio Lopez (1798-1876), President of Mexico.
Sappho (b. 600 B.C.), Greek poet.
Sardanapalus (710-606 B.C.), last king of Assyrian Empire.
Sardou, Victorien (1831-), French dramatist.
Sarto, Andrea del (1486-1531), Florentine fresco painter.
Savonarola, Girolamo (1452-98), Italian monk and reformer.
Saxe, John Godfrey (1816-87), American poet and journalist.
Saye and Sele, first Viscount (William Fiennes), (1582-1662), English politician.
Scanderbeg, George Castriota (1403-68), Albanian commander.
Schelling, Friedrich Wilhelm Joseph von (1775-1854), German philosopher.
Schiller, Johann Christoph (1759-1805), German poet.
Schlegel, August Wilhelm (1767-1845), German critic.
Schley, Winfield Scott (1839-), American naval officer.
Schopenhauer, Arthur (1770-1838), German philosopher.
Schubert, Franz Peter (1797-1828), German musical composer.
Schumann, Robert (1815-56), German musical composer.
Schuyler, Philip (1733-1804), American patriot and general.
Scipio, Publius Cornelius (234-183 B.C.), Roman general.
Scott, Sir Walter (1771-1832), English author.
Scott, Winfield (1786-1866), American general.
Scotus, Duns (14th century), scholar and philosopher.
Seabury, Samuel (1729-96), American divine and bishop.
Sedgwick, John (1813-64), American general.
Seneca, Marcus Annæus, Roman rhetorician.
Sennacherib (702-680 B.C.), Assyrian king.
Sévigné, Marie de Rabutin Chantal (1626-96), French writer.
Seward, William Henry (1801-72), American statesman.
Shaftesbury, Anthony Ashley Cooper, Earl of (1801-80), English statesman and philanthropist.
Shakespeare, William (1564-1616), English dramatist and poet.
Shalmaneser, name of four Assyrian kings.
Shay, Daniel (1747-1825), American insurgent.
Shelley, Percy Bysshe (1792-1823), English poet.
Sheridan, Philip Henry (1831-88), American general.
Sheridan, Richard Brinsley (1751-1816), English writer.
Sherman, William Tecumseh (1818-90), American general.
Siddons, Sarah (Kemble), (1755-1831), tragic actress.
Sidney, Sir Philip (1554-86), English author.
Sigismund (The Great), (1467-1548), King of Poland.
Silliman, Benjamin (1779-1860), American physicist.
Silva Paranhos, José Maria de (1819-80), Brazilian diplomat.
Simonides (556-467 B.C.), Greek lyric poet.
Sims, James Marion (1813-), American surgeon.
Sismondi, Jean Charles Léonard (de Simonde) de (1773-1842), Swiss economist.
Smith, Gerrit (1797-1874), American philanthropist.
Smith, John (1579-1608), English adventurer.
Smith, Joseph (1805-44), Mormon prophet and founder.
Smith, Rev. Sydney (1771-1845), English author.
Smithson, James (1766-1829), founder of Smithsonian Institution.
Smollett, Tobias George (1721-71), English novelist.
Sparks, Jared (1789-1866), American historian.
Spencer, Herbert (1820-1903), English philosopher.
Socrates (469-399 B.C.), Greek philosopher.
Solon (638-559 B.C.), Greek lawgiver.
Solyman ("The Magnificent"), (1490-1566), Sultan of Turk y.
Sontag, Henrietta (1806-54), German operatic vocalist.
Sophocles (495-380 B.C.), master of Greek tragedy.
Soto, Hernando de (1500-42), Spanish soldier, discoverer of the Mississippi River.
Soublette, Carlos (1790-1870), Venezuelan general and statesman.
Soult, Nicolas Jean de Dieu, Duc de Dalmatie (1769-1851), French marshal.
Southey, Robert (1774-1843), English poet.
Spenser, Edmund (1553-99), English poet.
Spinoza, Benedict (1632-77), Dutch philosopher.
Spurgeon, Charles Haddon (1834-96), English clergyman.
Staël-Holstein, Anne Louise Germaine Necker, Baronne de (1766-1817), French writer.

Stanley, Arthur Penrhyn (1815-81), French scholar and divine.
Stanley, Sir Henry Morton (1841-1904), African explorer.
Stanton, Edwin McMasters (1814-69), American statesman and jurist.
Steele, Sir Richard (1672-1729), English author.
Stephenson, George (1781-1848), founder of English railways.
Sterne, Laurence (1713-68), English author.
Steuben, Frederic William (1730-94), officer of American Revolution.
Stevenson, Robert Louis Balfour (1850-94), Scottish poet and writer.
Story, Joseph (1779-1845), American jurist.
Strabo (63 B.C.—A.D. 24), Greek geographer.
Strauss, Johann (1804-49), German composer.
Stradivari, Antonio (1644-1737), Italian maker of violins.
Stuart, Gilbert Charles (1756-1828), American painter.
Stuyvesant, Peter (1602-82), last Dutch governor of New York.
Suckling, Sir John (1608-42), English poet and dramatist.
Sue (Marie Joseph) Eugene (1804-57), French novelist.
Suleiman Pasha (1840-92), Turkish general.
Sulla, Cornelius (138-78 B.C.), Roman general.
Sullivan, Sir Arthur Seymour (1842-96), English composer and conductor.
Sully, Duc de, Maximilien de Béthune, Baron de Rosny (1560-1641), French Protestant statesman.
Sully, Thomas (1783-1872), American painter.
Sumner, Charles (1811-74), American statesman.
Swedenborg, Emanuel (1688-1772), Swedish religious writer.
Swift, Jonathan (1667-1745), British author.
Swithin, St. (820-893), English bishop.

T

Tacitus, Caius Cornelius (50-90), Roman historian.
Taine, Hippolyte Adolphe (1828-), French critic.
Talleyrand-Périgord, Charles Maurice (1764-1838), French statesman.
Tasso, Torquato (1544-95), Italian poet.
Tauchnitz, Karl Christian Philip (1761-1836), German publisher.
Taylor, Bayard (1825-78), American author.
Taylor, Jeremy (1613-67), English theologian.
Taylor, Zachary (1784-1850), twelfth President of the United States.
Tell, William (1290-1354), Swiss patriot.
Tennyson, Alfred (1810-92), English poet-laureate.
Teresa, Saint (1515-82), canonized 1621.
Tertullian (150-220), father of the Church.
Tesla, Nikola (1857-), Austro-Hungarian physicist and electrician.
Thackeray, William Makepeace (1811-63), English novelist.
Themistocles (514-449 B.C.), Athenian statesman.
Thiers, Louis Adolphe (1797-1877), French statesman.
Thomas, George Henry (1816-70), American general.
Thomas, Theodore (1835-), American musical conductor.
Thoreau, Henry David (1817-62), American essayist.
Thorwaldsen, Albert Bietel (1770-1844), Danish sculptor.
Thucydides (471-400 B.C.), Greek historian.
Tiberius, Claudius Nero (42 B.C.—A.D. 37), second Emperor of Rome.
Ticknor, George (1791-1871), American scholar and author.
Tilly, John Tzercias, Count of (1559-1632), German general.
Titian, Veceili (1477-1576), Italian painter.
Tocqueville, Alexis Charles Henri Clérel de (1805-59), French statesman.
Tolstoi, Count Lyoff Nikolaievich (1829-), Russian novelist and reformer.
Torquemada, Tomas de (1420-98), Dominican prior, first inquisitor-general in Spain.
Torrey, John (1796-1873), American botanist and chemist.
Townshend, Charles, Right Hon. (1725-67), English orator and statesman.
Trollope, Anthony (1815-82), English novelist.
Tromp, Martin Harpertzoon (1597-1653), Dutch admiral.
Trumbull, John (1756-1843), American painter.
Tschaikowsky, Peter Ilitch (1840-93), Russian composer.
Tupac, Amaru José Gabriel Condor Canqui (1742-81), Peruvian revolutionist.
Turenne, Henri de la Tour, d'Auvergne, Vicomte de (1611-75), French general.
Turgenieff, Ivan Sergeyevich (1818-83), Russian novelist.
Turner, Joseph Mallard William (1775-1851), English painter.
Tyler, John (1790-1862), tenth President of the United States.
Tyndall, John (1820-93), British physicist.

V

Van Buren, Martin (1782-1862), eighth President of the United States.
Vancouver, George (1758-98), British navigator.
Vanderbilt, Cornelius (1794-1877), American financier.
Van Dyck, Sir Anthony (1599-1641), Flemish painter.
Vane, Sir Henry (1612-62), English Puritan statesman and patriot.
Van Rensselaer, Stephen (1769-1839), American statesman.
Varas, Antonio (1817-86), Chilian jurist and statesman.
Vauban, Sebastien le Prestre de (1633-1707), French marshal and engineer.
Velasquez, Diego Rodriguez de Silva (1599-1660), Spanish painter.
Verdi, Giuseppe (1814-), Italian musical composer.
Verestchagin, Vasili (1842-1904), Russian painter.
Vergil, Publius Vergilius Maro (70-19 B.C.), Roman poet.
Vernet, Emile Jean Horace (1789-1863), French painter.
Vespasian, Titus Flavius Sabinus Vespasianus (9-79), Roman emperor.
Vespucci, Amerigo (1452-1512), Italian navigator.
Vibert, Jehan Georges (1840-1902), French painter.
Victor Emmanuel I (1820-78), King of Italy.
Victoria, Alexandrina (1819-1901), Queen of Great Britain, Empress of India.
Vieuxtemps, Henri (1820-81), Belgian violinist and composer for violin.
Vinci, Leonardo da (1452-1519), Italian painter.
Vokes, Rosina (1858-94), English actress.
Voltaire, François Marie Arouet (1694-1778), French writer.

W

Wagner, Wilhelm Richard (1813-83), German musical composer.
Wallace, Lew (1827-), American general, diplomatist, lawyer, and author.
Wallack, James William (1795-1864), Anglo-American actor and dramatic manager.
Wallack, James William (1818-73), Anglo-American actor.
Wallack, Lester (John Johnstone), (1820-88), American actor.
Wallenstein, Albrecht Eusebius von (1583-1634), Austrian general.
Walpole, Horace (1717-97), English author.
Walpole, Robert (1676-1745), English statesman.
Walsingham, Sir Francis (1536-90), English statesman.
Walton, Izaak (1593-1683), English author.
Ward, Artemas (1727-1800), American general.
Ward, Artemus (C. F. Browne), (1834-67), American humorist.
Washburne, Elihu Benjamin (1816-87), American statesman and diplomatist.
Washington, George (1732-99), American soldier and statesman, first President of the United States.
Watt, James (1736-1819), Scotch mechanician, inventor of the steam-engine.
Wayne, Anthony (1745-96), American general.
Weber, Baron Karl Maria Friedrich Ernst von (1786-1826), German musical composer.
Webster, Daniel (1782-1852), American statesman, orator, and lawyer.
Webster, Noah (1758-1843), American lexicographer and author.
Wellesley, Arthur (Duke of Wellington), (1769-1852), English general and statesman.
Wesley, John (1703-91), founder of Methodism.
West, Benjamin (1738-1820), American-English painter.
Whistler, James Abbott McNeill (1834-1903), American-English painter.
White, Gilbert (1720-93), English naturalist.
White, William (1748-1836), bishop and one of the organizers of the Protestant Episcopal Church in America.
Whitefield, George (1714-70), one of the founders of Methodism.
Whitman, Walt (Walter), (1819-92), American poet.
Whitney, Josiah Dwight (1819-96), American geologist.
Whitney, William Dwight (1827-94), American philologist.
Whittier, John Greenleaf (1807-92), American poet and author.
Wieland, Christopher Martin (1733-1813), German poet.
Winthrop, John (1587-1649), colonial governor.
Wolfe, James (1727-59), English general.
Wolsey, Thomas (1471-1530), English statesman and cardinal.
Wordsworth William, (1770-1850), English poet.
Wren, Sir Christopher (1632-1723). English architect.
Wyclif, John (1324-84), English reformer.

X

Xavier, Francis, St. (1506-52), Spanish Jesuit missionary.
Xenophon (430-357 B.C.), Greek historian.
Xerxes (519-465 B.C.) Persian king.
Ximenes de Quesada, Gonsalo (1498-1576), conqueror of New Granada.

Y

Young, Brigham (1801-1877), Mormon prophet and president.

Z

Zinzendorf und Pottendorf, Nicolaus Ludwig (1700-60), German religious reformer.
Zola, Emile (1840-1902), French novelist.
Zwingli, Ulrich (1484-1531), Swiss reformer.

NOTED EVENTS IN THE WORLD'S HISTORY

WHILE it would be quite impossible to give anything like a full or adequate account of the leading events in the history of the human race on earth, the following list of some of the more prominent will serve ordinary ends of reference and instruction. The list has been compiled solely with a view to giving a number of facts very often mentioned and referred to, so that the reader may readily determine the approximate dates of occurrence.

The study of history is a fascinating one, but it involves such a vast amount of space to treat even the record of one nation that little can be attempted without literally devoting the entire work to this subject alone.

EVENTS FROM 3317 B.C. TO 1904

B.C.	
3317	(about) The Noachian Deluge.
1652	The Exodus from Egypt.
1184	(about) Destruction of Troy.
878	Carthage founded.
753	Rome founded.
721	The Ten Tribes carried into captivity.
660	The Japanese Empire founded.
558	Jerusalem taken by Nebuchadnezzar.
536	Restoration of the Jews to Jerusalem.
509	Expulsion of the Tarquins from Rome.
490	Battle of Marathon.
480	Battles of Thermopylæ and Salamis.
479	Battle of Platæa.
431	The Peloponnesian War began.
390	Rome taken by the Gauls.
338	Battle of Chæronea.
334	Battle of Granicus.
333	Battle of Issus.
332	Battle of Arbela.
264	First Punic War began.
222	The Romans conquered Cis-Alpine Gaul.
218	Second Punic War began.
216	Battle of Cannæ; 70,000 Romans slain.
209	Battle of the Metaurus.
150	Third Punic War began.
146	Carthage destroyed by the Romans.
146	Greece subdued by Rome.
112	The Jugurthine War began.
60	Cæsar, Pompey, and Crassus formed the first Triumvirate.
55	Cæsar invaded Britain.
48	Cæsar defeated Pompey at Pharsalia.
31	Octavius became master of the civilized world.
4	Birth of Jesus Christ.

A.D.	
30	The Crucifixion.
64	First persecution of Christians (by Nero).
70	Jerusalem destroyed by Titus.
80	Herculaneum and Pompeii destroyed.
272	Aurelian conquered Zenobia, Queen of Palmyra.
313	Constantine converted to Christianity.
325	First Ecclesiastical Council at Nice.
395	The Roman Empire divided.
410	Rome sacked by the Visigoths.
449	The Saxons invaded England.
452	Battle of Chalons—defeat of the Huns.
455	Rome sacked by the Vandals.
476	End of the Western (Roman) Empire.
496	The kingdom of the Franks founded.
597	The English converted to Christianity.
609	Mahomet began his alleged mission.
711	The Arabs invaded Spain.
714	Battle of Tours. The Arabs driven from France.
800	Charlemagne crowned.
827	Egbert became first king of all England.
905	The Normans took Neustria (afterward called Normandy).
912	Five German nations confederated under Conrad.
1000	Leif Erikson visits North America.
1066	Battle of Hastings. Norman conquest.
1076	Jerusalem taken by the Turks.
1099	Jerusalem taken by the Crusaders.
1147	The Second Crusade.
1172	Henry II conquered Ireland.
1188	The Third Crusade.
1202	The Fourth Crusade.
1215	Magna Charta signed by King John.

1217 The Fifth Crusade.
1228 The Sixth Crusade.
1248 The Seventh Crusade.
1265 The first regular English Parliament.
1270 Eighth and last Crusade.
1291 The Holy Land retaken by the Turks.
1291 Rise of the Swiss Republic.
1314 Battle of Bannockburn.
1315 Battle of Morgarten. Swiss independence established.
1346 Battle of Crécy. Artillery first used.
1356 Battle of Poictiers.
1376 The English Parliament divided into two Houses.
1415 Battle of Agincourt.
1431 Joan of Arc burned.
1453 Constantinople taken by the Turks.
1455 The "Wars of the Roses" began.
1462 The Bible first printed (at Mentz).
1471 Caxton set up his printing press.
1479 The kingdoms of Castile and Aragon united.
1483 Martin Luther born.
1485 Battle of Bosworth Field. "Wars of the Roses" ended.
1492 Columbus discovered America.
1498 Savonarola burned.
1499 Brazil discovered by Cabral.
1508 League of Cambray.
1509 Rise of Protestantism.
1510 "First Holy League" formed (against France).
1513 Battle of Flodden Field.
1519 Cortez conquered Mexico.
1521 Magellan discovered the Philippine Islands.
1524 Battle of Pavia. Francis I of France defeated.
1526 Second Holy League (against Charles V).
1531 League of Smalcald (Protestant German States).
1532 Pizarro conquered Peru.
1534 England separated from the Roman Church.
1534 Cartier discovered the St. Lawrence.
1539 Monasteries closed in England.
1540 The Order of Jesuits founded.
1541 De Soto discovered the Mississippi.
1545 The Council of Trent.
1552 Peace of Passau (established Protestantism).
1558 Elizabeth crowned Queen of England.
1565 St. Augustine (Florida) founded.
1565 The Netherlands revolted from Spain.
1566 The Holy League formed in France to extirpate heresy.
1572 Massacre of St. Bartholomew.
1579 The Netherlands formed a republic.
1580 Drake circumnavigated the globe.
1588 The Spanish Armada destroyed.
1590 Battle of Ivry.
1598 Edict of Nantes.
1600 The East India Company chartered.
1602 First settlement in Massachusetts (temporary).
1604 First permanent settlement in Canada.
1605 The Gunpowder Plot (in England).
1606 The independence of Holland established.
1607 Jamestown, Va., founded.
1609 Henry Hudson discovered the Hudson River.
1610 Dutch settlement of Manhattan (New York).
1616 Shakespeare died.
1618 "The Thirty Years' War" began.
1618 Harvey announced his discovery of the circulation of the blood.
1619 Slavery introduced into Virginia.
1620 Landing of the Pilgrims.
1627 Delaware settled.
1630 Boston founded.
1632 Battle of Lutzen. Death of Gustavus Adolphus.
1633 Connecticut settled.
1634 Maryland settled.
1638 The Scottish Solemn League and Covenant formed.
1640 Cromwell's Long Parliament assembled.
1643 The United Colonies of New England formed.
1643 Battle of Rocroi.
1644 Battle of Marston Moor.
1645 Battle of Naseby.
1646 The Westminster Confession of Faith completed.
1648 Peace of Westphalia ending the Thirty Years' War.
1649 Charles I beheaded. The English Commonwealth declared.
1650 Battle of Dunbar.
1651 Battle of Worcester.
1651 Navigation Act passed in England.
1653 Oliver Cromwell became Lord Protector.
1660 Restoration of the Stuarts.
1664 New York taken from the Dutch.
1665 The Great Plague in London.
1666 The Great Fire in London.
1667 Peace of Breda end of naval war between England and Holland.
1668 Peace of Aix-la-Chapelle.
1673 Joliette and Marquette explored the Mississippi.
1675 King Philip's War in New England began.
1679 The Habeas Corpus Act passed in England.
1682 Pennsylvania settled.
1682 Peter the Great became Czar of Russia.
1685 Revocation of the Edict of Nantes.
1687 Newton announced the principle of gravitation.
1688 James II of England abdicated.
1688 The siege of Londonderry.
1690 Battle of the Boyne.
1690 The first newspaper in America (at Boston) printed.
1697 Peace of Ryswick between France and England.
1701 "The Grand Alliance," England, Holland, and Germany.
1702 War of the Spanish Succession.
1704 Battle of Blenheim.
1704 Gibraltar taken by the English.
1707 Final union of England and Scotland.
1708 Battle of Oudenarde.
1709 Battles of Pultowa, Mons, and Malplaquet.
1713 Peace of Utrecht.
1714 Accession of the House of Hanover in England.
1715 First Jacobite rebellion.
1717 Grand Lodge of Free Masons established in England.
1718 The Quadruple Alliance—England, France, Austria, Holland.
1720 The South Sea Bubble.
1739 Wesley founded Methodism.
1740 War of the Austrian Succession.
1745 Second Jacobite rebellion.
1745 Battle of Fontenoy.
1746 Battle of Culloden.
1748 Peace of Aix-la-Chapelle.
1752 French and Indian War.
1753 The Lisbon earthquake.
1754 Congress of American colonies, at Albany.
1755 Braddock's defeat.
1756 The Black Hole of Calcutta tragedy.

1756 The Seven Years' War in Europe.
1757 Battle of Plassey, India.
1759 The English conquered Canada.
1763 Peace of Paris.
1763 Steam-engine invented.
1763 Mason and Dixon's line established.
1765 The Stamp Act enacted.
1770 The Boston massacre.
1772 First partition of Poland.
1773 The "Boston Tea-Party."
1773 Steam-engine perfected by Watt.
1775 Battles of Lexington, Concord, and Bunker Hill.
1776 Declaration of Independence.
1776 Battles of Fort Moultrie, Long Island, and Trenton.
1777 Battles of Princeton, Brandywine, Germantown, Bennington, Stillwater, Saratoga.
1777 Treaty between the United States and France.
1777 Sufferings at Valley Forge.
1778 Battles of Monmouth and Savannah.
1780 Battles of Camden, Guilford Court-House, and King's Mountain.
1780 Benedict Arnold's treason.
1781 Battles of the Cowpens and Yorktown.
1781 Society of the Cincinnati organized.
1782 Wreck of the "Royal George," Portsmouth, England.
1783 New York evacuated by the British.
1783 Peace of Paris, United States, and Great Britain.
1787 The Northwest Territory constituted.
1787 The Constitution framed.
1788 First settlement in Australia.
1788 Trial of Warren Hastings.
1789 Washington inaugurated first President.
1789 The French Revolution began.
1791 Canada divided into ten provinces.
1792 The French Republic established.
1793 Louis XVI of France beheaded. "The Reign of Terror."
1793 The cotton-gin invented by Whitney.
1794 Jay's treaty.
1795 Second Triple Alliance (Great Britain, France, The Netherlands).
1796 Bonaparte's first brilliant campaign.
1796 Vaccination introduced by Jenner.
1798 The Irish rebellion.
1798 War between the United States and France.
1799 Napoleon repulsed at Acre.
1799 Napoleon declared First Consul.
1799 Battle of Seringapatam, India.
1799 Death of Washington.
1800 Battles of Marengo and Hohenlinden.
1801 Union of Great Britain and Ireland.
1801 War between the United States and Tripoli.
1802 Peace of Amiens.
1803 Louisiana purchased from France.
1804 Napoleon proclaimed Emperor.
1805 Battles of Ulm, Austerlitz, and Trafalgar. Death of Nelson.
1806 Confederation of the Rhine formed.
1806 Battle of Jena.
1807 Battles of Eylau and Friedland.
1807 Treaty of Tilsit.
1807 Fulton's first steamboat sailed.
1807 The Peninsular War.
1809 Battles of Corunna, Wagram, etc.
1809 Peace of Vienna.
1812 United States declared war against Great Britain.
1812 Napoleon invaded Russia.
1813 Perry's victory on Lake Erie.
1813 Battles of Lutzen and Bautzen.
1813 Creek Indian War.
1814 Battle of Plattsburgh.
1814 Washington burned by the British.
1814 Sweden and Norway federated.
1815 The Holy Alliance—Austria, Russia, Prussia, France, The Netherlands.
1815 Battle of New Orleans.
1815 Peace of Ghent.
1815 Battle of Waterloo.
1816 American Bible Society founded.
1817 Seminole Indian War.
1818 Congress of Sovereigns (Holy Alliance) at Aix-la-Chapelle.
1819 The first steamship crossed the Atlantic.
1819 Florida obtained from Spain.
1820 The "Missouri Compromise" adopted.
1822 The massacre of Scio, Greece.
1823 The Monroe Doctrine declared.
1824 Mexico's independence established.
1827 The Treaty of London.
1827 Battle of Navarino.
1828 The first passenger railway in the United States opened.
1829 The Catholic Emancipation Act, Great Britain.
1829 The first Oxford-Cambridge boat race.
1830 The kingdom of Belgium established.
1830 Three Days' Revolution in Paris. Louis Philippe made King.
1831 The Black Hawk War.
1832 A reform bill passed by Parliament.
1832 South Carolina Nullification Ordinance.
1832 Peace of Adrianople.
1833 Slavery abolished in the British Colonies.
1834 The Quadruple Alliance—England, France, Portugal, Spain.
1835 Morse invented the telegraph.
1835 Great fire in New York.
1835 The Seminole War.
1836 Battle of San Jacinto. Independence of Texas.
1836 First telegraph message sent.
1837 Accession of Queen Victoria.
1840 The Ashburton Treaty between Great Britain and the United States.
1845 Texas annexed.
1846 Battles of Palo Alto and Resaca de la Palma (Mexican War).
1846 Irish potato famine.
1846 British corn laws repealed.
1847 Battles of Buena Vista, Vera Cruz, etc. (Mexican War).
1848 French Revolution. A Republic established.
1848 Gold discovered in California.
1848 Peace of Guadaloupe. End of the Mexican War.
1848 Salt Lake City settled.
1849 Battle of Temesvar. Subjugation of Hungary.
1851 First International Exhibition, London.
1852 Louis Napoleon became Emperor.
1852 The first Harvard-Yale boat race.
1853 The Crimean War began.
1854 Battles of Alma, Balaklava, and Inkerman.
1854 Treaty of Austria.
1854 Japan made her first foreign treaty.
1855 The Panama Railroad opened.
1856 The Seminole War.
1857 The great mutiny in India.
1859 The Austrian-Italian War began.
1859 John Brown's raid into Virginia.
1860 Secession of South Carolina.
1861 The War of the Rebellion began in the United States.

1861 Battle of Bull Run.
1861 Emancipation of the Roman serfs.
1862 Battles of Fort Donelson, Shiloh, Williamsburg, Fort Pillow, Seven Pines, Seven Days, Cedar Mountain, Groveton, Second Bull Run, Antietam; Perryville, Fredericksburg, Murfreesboro, etc.
1862 Lincoln's emancipation proclamation.
1863 Battles of Fort Hindman, Chancellorsville, Vicksburg, Gettysburg, Chickamauga, etc.
1864 Battles of The Wilderness, Spottsylvania, Cold Harbor, Kenesaw Mountain, Malvern Hill, Jonesboro, Winchester, Cedar Creek, etc.
1865 Sherman's march to the sea.
1865 Battles of Fort Fisher, Fort Steadman, Five Forks.
1865 Lee's surrender at Appomattox.
1866 Formal proclamation of the end of the Civil War.
1866 Grand Army of the Republic organized.
1866 Alaska purchased.
1866 First successful Atlantic cable laid.
1866 Battle of Sadowa.
1867 Monarchy of Austria-Hungary established.
1867 The Dominion of Canada established.
1868 Poland incorporated with Russia.
1868 The Fourteenth Amendment to the Constitution adopted.
1869 The Suez Canal completed.
1870 Rome became the capital of Italy.
1870 The Franco-Prussian War.
1871 Feudalism in Japan abolished.
1871 William of Prussia becomes German Emperor.
1871 The Irish Church disestablished.
1871 Great fire in Chicago.
1872 Great fire in Boston.
1876 Centennial Exposition in Philadelphia.
1877 The Russo-Turkish War began.
1877 Queen Victoria proclaimed Empress of India.
1881 President Garfield assassinated.
1882 British occupation of Egypt.
1882 Third Triple Alliance—Austria, Germany, Italy.
1883 Eruption of the volcano Krakatoa—36,000 perished.
1884 New Orleans' World's Industrial Exposition.
1889 Brazil became a republic.
1893 World's Columbian Exposition, Chicago.
1894 The war between China and Japan began.
1894 Mid-Winter Exposition, San Francisco.
1895 The Cuban Rebellion became general.
1895 Cotton States' Exposition, Atlanta.
1897 War between Turkey and Greece.
1897 Tennessee Centennial Exposition, Nashville.
1898 The Spanish-American War.
1898 Trans-Mississippi Exposition, Omaha.
1899 The Hague Court of Arbitration established.
1899 The Filipino insurrection.
1900 Hawaii annexed.
1900 Boxer insurrection in China.
1900 Tornado at Galveston, Texas.
1900 Italian Polar Exposition reached 86° 33′ N.
1901 Pan-American Exposition, Buffalo.
1901 Assassination of President McKinley.
1901 Death of Queen Victoria.
1901 Exposition at Charleston, S. C.
1902 First Congress of the Republic of Cuba.
1902 Anthracite coal strike in Pennsylvania.
1902 Accession of Edward VII.
1902 Civil Government established in the Philippines.
1902 Great Volcanic Eruption in Martinique.
1903 Massacre of Jews in Kishineff, Russia.
1903. Cable laid from the United States to the Philippines.
1903 Wireless Messages sent from America to England.
1903 Leo XIII died. Accession of Pius X.
1904 Irish Land Bill passed by Parliament.
1904 The Louisiana Purchase Exposition at St. Louis.
1904 Independence of Panama Republic.
1904 War between Japan and Russia.
1904 The burning of the excursion steamer "General Slocum" with loss of a thousand lives.

HINTS TO HOUSEKEEPERS

THE questions connected with the practical management of the household, particularly such as refer to culinary processes, are not only inevitable, but important. As in nearly every other department of present-day activity, the first requirement is a knowledge of the facts —of what to do, when to do, and how to do the things that all know should be done. It is, therefore, not a surprising matter that housekeeping, including cookery and the allied arts, is a thing to be studied and learned, like any other calling. Indeed, in order that a housekeeper should be successful, should make her means go as far as possible and with complete satisfaction to all concerned, she must learn, in the first place, that hers is an art to be studied and learned, like any other calling, trade, or profession. Furthermore, as in other branches of human effort, experience and observation alone furnish the real preparation, yet much can be learned from reading and careful observance of rules and regulations formulated by authorities in this department.

To supply the needed rudiments of the housekeeping art, the following pages have been written. Of course, many questions will naturally arise for which no answer is here found; yet a careful observance of the rules here following can furnish the best possible preparation for answering them as they occur.

CHOICE OF ARTICLES OF FOOD

NOTHING is more important in the affairs of housekeeping than the choice of wholesome food.

MACKEREL must be perfectly fresh. The firmness of the flesh and the clearness of the eyes must be the criteria of fresh mackerel, as they are of all other fish.

FLOUNDERS, and all flat white fish, are rigid and firm when fresh; the under side should be of a rich cream color.

COD is known to be fresh by the rigidity of the muscles (or flesh); the redness of the gills, and clearness of the eyes.

SALMON.—The flavor and excellence of this fish depend upon its freshness, and the shortness of time since it was caught.

HERRINGS can only be eaten when very fresh.

FRESH WATER FISH.—The remarks as to firmness and clear, fresh eyes apply to this variety of fish, of which there are pike, perch, etc.

LOBSTERS recently caught have always some remains of muscular action in the claws, which may be excited by pressing the eyes with the finger; when this can not be produced, the lobster must have been too long kept. When boiled, the tail pre-

serves its elasticity if fresh, but loses it as soon as it becomes stale.

CRABS have an agreeable smell when fresh.

PRAWNS AND SHRIMPS, when fresh, are firm and crisp.

OYSTERS.—If fresh, the shell is firmly closed; when the shells of oysters are open, they are dead and unfit for food. The small-shelled oysters are the finest in flavor. Larger kinds are generally considered only fit for stewing and sauces, though some persons prefer them.

BEEF.—The grain of ox beef, when good, is loose, the meat red, and the fat inclining to yellow. When meat pressed by the finger rises up quickly, it may be considered as that of an animal which was in its prime; when the dent made by pressure returns slowly, or remains visible, the animal had probably passed its prime, and the meat consequently must be of inferior quality.

VEAL should be delicately white, though it is often juicy and well flavored when rather dark in color. On examining the loin, if the fat enveloping the kidney be white and firm looking, the meat will probably be prime, and recently killed.

MUTTON.—The meat should be firm and close in grain, and red in color, the fat white and firm. Mutton is in its prime when the sheep is about five years old, though it is often killed much younger. If too young, the flesh feels tender when pinched; if too old, on being pinched it wrinkles up, and so remains. In young mutton, the fat readily separates; in old, it is held together by strings of skin.

LAMB.—This meat will not keep long after it is killed. The large vein in the neck is bluish in color when the forequarter is fresh, green when becoming stale. In the hindquarter, if not recently killed, the fat of the kidney will have a slight smell, and the knuckle will have lost its firmness.

PORK.—When good, the rind is thin, smooth, and cool to the touch; when changing, from being too long killed, it becomes flaccid and clammy.

BACON should have a thin rind, and the fat should be firm and tinged with red by the curing; the flesh should be of a clear red, without intermixture of yellow, and it should firmly adhere to the bone. To judge the state of a ham, plunge a knife into it to the bone; on drawing it back, if particles of meat adhere to it, or if the smell is disagreeable, the curing has not been effectual, and the ham is not good; it should, in such a state, be immediately cooked.

VENISON.—When good, the fat is clear, bright, and of considerable thickness.

TURKEYS.—In choosing poultry, the age of the bird is the chief point to be attended to. An old turkey has rough and reddish legs; a young one, smooth and black. Fresh killed, the eyes are full and clear, and the feet moist. When it has been kept too long, the parts about the vent begin to wear a greenish, discolored appearance.

COMMON DOMESTIC FOWLS, when young, have the legs and combs smooth; when old, they are rough, and on the breast long hairs are found instead of feathers. Fowls and chickens should be plump on the breast, fat on the back, and white legged.

GEESE.—The bills and feet are red when old, yellow when young. Fresh killed, the feet are pliable, stiff when too long kept. Geese are called green while they are only two or three months old.

DUCKS.—Choose them with supple feet and hard, plump breasts. Tame ducks have yellow feet, wild ones red.

PIGEONS are very indifferent food when they are too long kept. Suppleness of the feet shows them to be young; the state of the flesh is flaccid when they are getting bad from keeping. Tame pigeons are larger than the wild.

PARTRIDGES, when young, have yellow legs and dark-colored bills. Old partridges are very indifferent eating.

WOODCOCK AND SNIPE, when old, have the feet thick and hard; when these are soft and tender, they are both young and fresh killed. When their bills become moist, and their throats muddy, they have been too long killed.

SEASONABLE FOODS

There is an old maxim, "A place for everything, and everything in its place." To which we beg to add another, "A season for everything, and everything in season."

JANUARY

[Fish, poultry, etc., distinguished by *italics* are to be had in the highest perfection.]

FISH.—Cod, crabs, eels, flounders, herrings, lobsters, oysters, perch, pike, sturgeon, porgies.

MEAT.—Beef, house-lamb. mutton, pork, veal, and doe venison.

POULTRY AND GAME.—Capons, chickens, ducks, wild-ducks, fowls, geese, partridges, pheasants, pigeons (tame), pullets, *rabbits,* snipe, turkeys (hen), woodcock.

VEGETABLES.—Beets, sprouts, cabbage, cardoons, carrots, celery, onions, parsnips, potatoes, turnips.

FRUIT.—Almonds, apples.

FEBRUARY

FISH.—Cod, crabs, flounders, herrings, oysters, perch, pike, sturgeon, porgies.

MEAT.—Beef, house-lamb, mutton, pork, veal.

POULTRY AND GAME.—Capons, chickens, ducklings, fowls (wild), green geese, partridges, pheasants, pigeons (tame and wild), pullets, rabbits, snipe, turkeys, woodcock.

VEGETABLES.—Beets, cabbage, carrots, celery, mushrooms, onions, parsnips, potatoes, turnips.

FRUIT.—Apples, chestnuts, oranges.

MARCH

FISH.—Eels, crabs, flounders, lobsters, mackerel, oysters, perch, pike, shrimp, sturgeon, smelts, porgies.

MEAT.—Beef, house-lamb, mutton, pork, veal.

POULTRY AND GAME.—Capons, chickens, ducklings, fowls, green geese, pigeons, rabbits, snipe, turkeys, woodcock.

VEGETABLES.—Beets, carrots, celery, cress, onions, parsnips, potatoes, turnip tops.

FRUIT.—Apples, chestnuts, oranges.

APRIL

FISH.—Shad, cod, *crabs,* eels, flounders, halibut, herrings, *lobsters,* mackerel, oysters, perch, pike, *salmon,* shrimps, smelts, sturgeon, trout, porgies.

MEAT.—Beef, *grass-lamb,* mutton, pork, veal.

POULTRY AND GAME.—Chickens, ducklings, fowls, green geese, leverets, pigeons, pullets, rabbits, turkey-poults, wood-pigeons.

VEGETABLES.—Onions, parsnips, spinach, small salad, turnip tops, and rhubarb.

FRUIT.—Apples, nuts, oranges, pears.

MAY

FISH.—*Shad,* cod, *crabs,* eels, flounders, halibut, herring, *lobsters,* mackerel, mullet, perch, pike, *salmon,* shrimps, smelts, sturgeon, trout, clams.

MEAT.—Beef, grass-lamb, house-lamb, mutton, pork, veal.

POULTRY AND GAME.—Chickens, fowls, green geese, pigeons, pullets, rabbits.

VEGETABLES.—Artichokes, green peas, asparagus, kidney-beans, cabbage, carrots, onions, peas, potatoes, radishes, rhubarb, salad, spinach, turnips.

FRUIT.—Apples, pears.

JUNE

FISH.—Cod, shad, *crabs,* eels, flounders, herrings, *lobsters,* mackerel, perch, pike, *salmon,* clams, smelts, sturgeon, trout, catfish, blackfish.

MEAT.—Beef, *grass-lamb,* mutton, pork, veal.

POULTRY AND GAME.—Chickens, ducklings, fowls, green geese, pigeons, pullets, rabbits.

VEGETABLES.—Asparagus, beans, white beets, cabbage, carrots, cucumbers, leeks, lettuce, onions, parsley, peas, potatoes, radishes, salad of all sorts, spinach, turnips.

FRUIT.—Apples, apricots, cherries, currants, gooseberries, melons, pears, strawberries.

JULY

FISH.—Cod, *crabs,* flounders, herrings, *lobsters, mackerel,* perch, pike, salmon, trout, *bluefish, blackfish, bass, pickerel, catfish,* eels, clams, porgies.

MEAT.—Beef, *grass-lamb,* mutton, veal, buck-venison.

POULTRY AND GAME.—*Chickens,* ducks, fowls, *green geese,* leverets, pigeons, plovers, rabbits, *wild-pigeons.*

VEGETABLES.—Artichokes, balm, asparagus, beans, carrots, cauliflowers, celery, cucumbers, herbs of all sorts, lettuce, mint, mushrooms, peas, potatoes, radishes, salads of all sorts, spinach, turnips, tomatoes, Carolina potatoes.

FOR DRYING.—Mushrooms.

FOR PICKLING.—French beans, red cabbage, cauliflowers, garlic, gherkins, onions.

FRUIT.—Apples, apricots, cherries, currants, *damsons,* gooseberries, melons, nectarines, peaches, pears, oranges, pineapples, plums, raspberries, strawberries.

AUGUST

FISH.—Cod, eels, crabs, flounders, herrings, lobsters, *mackerel, perch, pike, salmon, bluefish, blackfish, weakfish, sheepshead, trout, porgies, clams.*

MEAT.—Beef, grass-lamb, mutton, veal, buck-venison.

POULTRY AND GAME.—Chickens, ducks, fowls, *green geese*, pigeons, plovers, rabbits, wild ducks, wild pigeons, reedbird, curlew.

VEGETABLES.—Artichokes, beans, white-beet, carrots, cauliflowers, cucumbers, pot-herbs of all sorts, leeks, lettuce, mushrooms, onions, peas, potatoes, radishes, salad of all sorts, spinach, turnips, tomatoes.

FOR DRYING.—Basil, sage, thyme.

FOR PICKLING.—Red cabbage, tomatoes, walnuts.

FRUIT.—Apples (summer pippin), cherries, currants, damsons, gooseberries, melons, grapes, mulberries, nectarines, peaches, pears, plums (green gages), raspberries.

SEPTEMBER

FISH.—Cockles, cod, crabs, eels, flounders, lobsters, *oysters, perch, pike*, shrimps, porgies, blackfish, weakfish.

MEAT.—Beef, mutton, pork, veal, buck-venison.

POULTRY AND GAME.—Chickens, ducks, fowls, green geese, *partridges*, pigeons, plovers, rabbits, turkeys, *wild ducks*, wild pigeons, quail.

VEGETABLES.—Artichokes, beans, cabbages, carrots, cauliflowers, celery, cucumbers, herbs of all sorts, leeks, lettuce, mushrooms, onions, parsnips, peas, potatoes, radishes, salad of all sorts, turnips, tomatoes, Carolina potatoes.

FRUIT.—Apples, damsons, grapes, hazelnuts, medlars, peaches, pears, pineapples, plums, quinces, strawberries, walnuts.

OCTOBER

FISH.—Cockles, cod, crabs, eels, gudgeons, halibut, lobsters, mussels, oysters, perch, *pike*, salmon-trout, shrimps, smelts, porgies.

MEAT.—Beef, mutton, pork, veal, doe-venison.

POULTRY AND GAME.—Chickens, ducks, fowls, green geese, larks, partridges, *pheasants*, pigeons, reedbird, blackbird, robins, snipe, turkeys, wild ducks, wild pigeons, rabbits, woodcock, teal.

VEGETABLES.—Artichokes, cabbages, cauliflowers, celery, herbs of all sorts, onions, parsnips, peas, potatoes, radishes, salad, spinach (winter), tomatoes, turnips, Carolina potatoes.

FRUIT.—Almonds, apples, black and white damsons, hazelnuts, grapes, peaches, pears, quinces, walnuts.

NOVEMBER

FISH.—Cockles, cod, crabs, eels, gudgeons, halibut, lobsters, mussels, oysters, perch, *pike*, salmon, shrimps, smelts, porgies, flounders.

MEAT.—Beef, house-lamb, mutton, pork, veal, doe-venison.

POULTRY AND GAME.—Chickens, ducks, fowls, *geese*, larks, partridges, pheasants, pigeons, rabbits, *snipe*, turkeys, wild ducks, *woodcock*, robins.

VEGETABLES.—Beets, cabbages, carrots, celery, herbs of all sorts, lettuce, onions, parsnips, potatoes, salad, spinach, tomatoes, turnips.

FRUIT.—Almonds, apples, chestnuts, hazelnuts, grapes, pears.

DECEMBER

FISH.—*Cod*, crabs, eels, gudgeons, halibut, lobsters, oysters, perch, pike, salmon, shrimps, smelts, sturgeon.

MEAT.—Beef, house-lamb, mutton, pork, veal, doe-venison.

POULTRY AND GAME.—Capons, chickens, ducks, fowls, geese, guinea-fowl, hares, larks, partridges, pea-fowl, pheasants, pigeons, rabbits, snipe, turkeys, wild ducks, woodcock.

VEGETABLES.—Beets, cabbages, carrots, celery, herbs of all sorts, lettuce, onions, parsnips, potatoes, salad, spinach, turnips.

FRUIT.—Apples, chestnuts, hazelnuts.

NAMES AND SITUATIONS OF THE JOINTS

The method of cutting up the carcasses varies. That which we describe below is the most general.

BEEF.—*Forequarter.*—Fore rib (five ribs); middle rib (four ribs); chuck (three ribs). Shoulder piece (top of fore leg); brisket (lower or belly part of the ribs); clod (fore shoulder-blade); neck; shin (below the shoulder); cheek.

Hindquarter.—Sirloin; rump; aitchbone—these are the three divisions of the upper part of the quarter; buttock and mouse-buttock, which divide the thigh; veiny piece, joining buttock; thick flank and thin flank (belly pieces) and leg. The sirloin and rump of both sides form a baron. ***Beef is in season all the year; best in the winter.***

MUTTON.—Shoulder; breast (the belly); over which are the loin (chump, or tail end). Loin (best end); and neck (best end); neck (scrag end). A chine is two necks; a saddle, two loins; then there are the leg and head. *Mutton is best in winter, spring, and autumn.*

LAMB is cut into forequarter and hindquarter; a saddle or loin; neck, breast, leg, and shoulder. *Grass-lamb is in season from June to August.*

PORK is cut into leg, hand, or shoulder; hindloin; foreloin; belly part; spare rib (or neck), and head. *Pork is in season nearly all the year.*

VEAL is cut into neck (scrag end); neck (best end); loin (best end); loin (chump or tail end); fillet (upper part of the hind leg); hind knuckle (which joins the fillet knuckle of foreleg); blade (bone of shoulder); breast (best end); breast (brisket end), and hand. *Veal is always in season, but dear in the winter and spring.*

VENISON is cut into haunch (or back); neck, shoulder, and breast. *Doe-venison is best in January, October, November, and December, and buck-venison in June, July, August, and September.*

OX-TAIL is much esteemed for purposes of soup; so also is the cheek. The tongue is highly esteemed.

CALVES' HEADS are very useful for various dishes; so also their knuckles, feet, heart, etc.

COOKING.—Ten pounds of beef require from two hours to two hours and a half roasting, eighteen inches from a good hot fire.

Six pounds require one hour and a quarter to one hour and a half, fourteen inches from a good clear fire.

Three ribs of beef, boned and rolled, tied round with paper, will require two hours and a half, eighteen inches from the fire; baste once only.

The first three ribs of fifteen or twenty pounds will take three hours or three and a half; the fourth and fifth ribs will take as long, managed in the same way as the sirloin. Paper the fat and the thin part, or it will be done too much before the thick part is done enough.

When beef is very fat, it does not require basting; if very lean, tie it up in greasy paper and baste frequently and well.

Common cooks are generally fond of too fierce a fire and of putting things too near to it.

Slow roasting is as advantageous to the tenderness and flavor of meat as slow boiling.

The warmer the weather, and the staler killed the meat is, the less time it will require to roast it.

Meat that is very fat requires more time than other meat.

In the hands of an expert cook, "alimentary substances are made almost entirely to change their nature, their form, consistence, odor, savor, color, chemical composition, etc.; everything is so modified that it is often impossible for the most exquisite sense of taste to recognize the substance which makes up the basis of certain dishes. The greatest utility of the kitchen consists in making the food agreeable to the senses and rendering it easy of digestion."

BOILING extracts a portion of the juice of meat, which mixes with the water, and also dissolves some of its solids; the more fusible parts of the fat melt out, combine with the water, and form soup or broth. The meat loses its red color, becomes more savory in taste and smell, and more firm and digestible. If the process is continued *too long*, the meat becomes indigestible, less succulent, and tough.

To boil meat to perfection, it should be done slowly, in plenty of water, replaced by other hot water, as evaporation takes place for, if boiled too quickly, the outside becomes tough; and not allowing the ready transmission of heat, the interior remains rare.

The loss by boiling varies from 6¼ to 16 per cent. The average loss on boiling butcher's meat, pork, hams, and bacon, is 12; and on domestic poultry, is 14¾.

The loss per cent on boiling salt beef is 15; on legs of mutton, 10; hams, 12½; salt pork, 13⅓; knuckles of veal, 8⅓; bacon, 6¼; turkeys, 16; chickens, 13½.

The established rule as regards time is to allow a quarter of an hour for each pound of meat if the boiling is rapid, and twenty minutes if slow. There are exceptions to this; for instance, ham and pork, which require from twenty to twenty-five minutes per pound, and bacon, nearly half an hour. For solid joints allow fifteen minutes for every pound, and from ten to twenty minutes over; though, of course, the length of time will depend much on the strength of the fire, regularity in the boiling, and size of the joint. The following table will be useful as an average of the time required to boil the various articles:

	H.	M.
A ham, 20 lbs. weight, requires ...	6	30
A tongue (if dry), after soaking	4	00
A tongue, out of pickle.....2½ to	3	00
A neck of mutton	1	30
A chicken.....	0	20
A large fowl.....	0	45
A capon.....	0	35
A pigeon	0	15

The loss by roasting varies, according to a good authority, from 14 3-5ths to nearly double that rate, per cent. The average loss on roasting butcher's meat is 22 per cent, and on domestic poultry is 20½.

The loss per cent on roasting beef, viz., on sirloins and ribs together, is 19 1-6th; on mutton, viz., legs and shoulders together, 24 4-5ths; on forequarters of lamb, 22 1-3d; on ducks, 27 1-5th; on turkeys, 20½; on geese, 19 1-3; on chickens, 14 3-5ths.

BROILING requires a brisk, rapid heat, which, by producing a greater degree of change in the affinities of the raw meat than roasting, generates a higher flavor, so that broiled meat is more savory than roast. The surface becoming charred, a dark-colored crust is formed, which retards the evaporation of the juices; and therefore, if properly done, broiled may be as tender and juicy as roasted meat.

BAKING does not admit of the evaporation of the vapors so rapidly as the processes of broiling and roasting; the fat is also retained more, and becomes converted by the agency of the heat into an empyreumatic oil, so as to render the meat less fitted for delicate stomachs and more difficult to digest. The meat is, in fact, partly boiled in its own confined water and partly roasted by the dry hot air of the oven.

The loss by baking has not been estimated; and, as the time required to cook many articles must vary with their size, nature, etc., we have considered it better to leave that until giving the receipts for them.

FRYING is of all methods the most objectionable, from the foods being less digestible when thus prepared, as the fat employed undergoes chemical changes. Olive oil in this respect is preferable to lard or butter.

ROAST BEEF.—The tenderloin and first and second cuts off the rack are the best roasting pieces—the third and fourth cuts are good. When the meat is put to the fire, a little salt should be sprinkled on it and the bony side turned toward the fire first. When the bones get well heated through, turn the meat and keep a brisk fire—baste it frequently while roasting. There should be a little water put into the dripping pan when the meat is put down to roast. If it is a thick piece, allow fifteen minutes to each pound to roast it in; if thin, less time will be required.

BEEFSTEAK.—The tenderloin is the best piece for broiling—a steak from the round or shoulder clod is good and comes cheaper. If the beef is not very tender, it should be laid on a board and pounded before broiling or frying it. Wash it in cold water, then lay it on a gridiron, place it on a hot bed of coals, and broil it as quickly as possible without burning it. If broiled slow, it will not be good. It takes from fifteen to twenty minutes to broil a steak. For seven or eight pounds of beef, cut up about a quarter of a pound of butter. Heat the platter very hot that the steak is to be put on, lay the butter on it, take up the steak, salt and pepper it on both sides. Beefsteak, to be good, should be eaten as soon as cooked. A few slices of salt pork broiled with the steak makes a rich gravy with a very little butter. There should always be a trough to catch the juices of the meat when broiled. The same pieces that are good broiled are good for frying. Fry a few slices of salt pork brown, then take them up and put in the beef. When brown on both sides, take it up; take the pan off from the fire, to let the fat cool; when cool, turn in half a teacupful of water, mix a couple of teaspoonfuls of flour with a little water, stir it into the fat, put the pan back on the fire, stir it till it boils up, then turn it over the beef.

ALAMODE BEEF.—The round of beef is the best piece to alamode—the shoulder clod is good, and comes lower; it is also good stewed, without any spices. For five pounds of beef, soak about a pound of bread in cold water till soft, then drain off the water, mash the bread fine, put in a piece of butter of the size of a hen's egg, half a teaspoonful of salt, the same quantity of ground cloves, allspice, and pepper, half a nutmeg, a couple of eggs, and a tablespoonful of flour—mix the whole well together; then cut gashes in the beef and fill them with about half of the dressing, put the meat in a bake-pan, with lukewarm water enough to cover it; set it where it will stew gently for a couple of hours; cover it with a heated bake-pan lid. When it has stewed a couple of hours, turn the reserved dressing on top of the meat, heat the bake-pan lid hot enough to brown the dressing, stew it an hour and a half

longer. After the meat is taken up, if the gravy is not thick enough, mix a teaspoonful or two of flour with a little water, and stir it into the gravy; put in a little butter, a wineglassful of wine, and turn it over the meat.

Beef Liver.—Liver is very good fried, but the best way to cook it is to broil it ten minutes with four or five slices of salt pork. Then take it out, cut it into small strips together with the pork, put it in a stew-pan, with a little water, butter and pepper. Stew it four or five minutes.

To Corn Beef.—To every gallon of cold water put a quart of rock salt, an ounce of saltpetre, quarter of a pound of brown sugar (some people use molasses, but it is not as good); no boiling is necessary. Put the beef in the brine. As long as any salt remains at the bottom of the cask it is strong enough. Whenever any scum rises, the brine should be scalded, skimmed, and more sugar, salt, and saltpetre added. When a piece of beef is put in the brine, rub a little salt over it. If the weather is hot, cut a gash to the bone of the meat, and fill it with salt. Put a heavy weight on the beef in order to keep it under the brine. In very hot weather, it is difficult to corn beef in cold brine before it spoils. On this account it is good to corn it in the pot when boiled. It is done in the following manner: to six or eight pounds of beef, put a teacup of salt; sprinkle flour on the side that is to go upon the table, and put it down in the pot, turn the water into the pot after the beef is put in, boil it a couple of hours, then turn in more cold water, and boil it an hour and a half longer.

Mutton.—The saddle is the best part to roast—the shoulder and leg are good roasted; but the best mode to cook the latter is to boil it with a piece of salt pork. A little rice boiled with it improves the look of it. Mutton for roasting should have a little butter rubbed on it, and a little salt and pepper sprinkled on it—some people like cloves and allspice. Put a small piece of butter in the dripping-pan, and baste it frequently. The bony side should be turned toward the fire first, and roasted. For boiling or roasting mutton, allow a quarter of an hour to each pound of meat. The leg is good cut in gashes, and filled with a dressing, and baked. The dressing is made of soaked bread, a little butter, salt, and pepper, and a couple of eggs. A pint of water with a little butter should be put in the pan. The leg is also good cut into slices and broiled. It is good corned a few days, and then boiled. The rack is good for broiling—it should be divided, each bone by itself, broiled quick, and buttered, salted and peppered. The breast of mutton is nice baked. The joints of the brisket should be separated, the sharp ends of the ribs sawed off, the outside rubbed over with a little piece of butter—salt it, and put it in a bake-pan, with a pint of water. When done, take it up, and thicken the gravy with a little flour and water, and put in a small piece of butter. A tablespoonful of catsup, cloves and allspice improves it, but is not essential. The neck of mutton makes a good soup. Parsley or celery heads are a pretty garnish for mutton.

Veal.—The loin of veal is the best piece for roasting. The breast and rack are good roasted. The breast also is good made into a pot-pie, and the rack cut into small pieces and broiled. The leg is nice for frying, and when several slices have been cut off for cutlets, the remainder is nice boiled with a small piece of salt pork. Veal for roasting should be salted, peppered, and a little butter rubbed on it, and basted frequently. Put a little water in the dripping-pan, and unless the meat is quite fat, a little butter should be put in. The fillet is good baked, the bone should be cut out, and the place filled with a dressing made of bread soaked soft in cold water, a little salt, pepper, a couple of eggs, and a tablespoonful of melted butter put in—then sew it up, put it in your bake-pan, with about a pint of water, cover the top of the meat with some of the dressing. When baked sufficiently, take it up, thicken the gravy with a little flour and water well mixed, put in a small piece of butter and a little wine and catsup, if you like the gravy rich.

Veal Cutlets.—Fry three or four slices of pork until brown—take them up, then put in slices of veal, about an inch thick, cut from the leg. When brown on both sides, take them up; stir half a pint of water into the gravy, then mix two or three teaspoonfuls of flour with a little water, and stir it in; soak a couple of slices of toasted bread in the gravy, lay them on the bottom of the platter, place the meat and pork over it, then turn on the gravy. A very nice way to cook the cutlets is to make a batter with half a pint of milk, an egg beaten to a froth, and flour enough to render it thick. When the veal is fried brown, dip it into the batter, then put it back into the fat, and fry it until brown again. If

you have any batter left, it is nice dropped by the large spoonful into the fat, and fried till brown, then laid over the veal. Thicken the gravy and turn it over the whole. It takes about an hour to cook this dish. If the meat is tough, it will be better to stew it half an hour before frying it.

CALF'S HEAD.—Boil the head two hours, together with the lights and feet. Put in the liver when it has boiled an hour and twenty minutes. Before the head is done, tie the brains in a bag, and boil them with it; when the brains are done, take them up, season them with salt, pepper, butter, and sweet herbs, or spices if you like—use this as a dressing for the head. Some people prefer part of the liver and feet for dressing; they are prepared like the brains. The liquor that the calf's head is boiled in makes a good soup seasoned in a plain way like any other veal soup, or seasoned turtle fashion. The liquor should stand until the next day after the head is boiled, in order to have the fat rise, and skimmed off. If you wish to have your calf's head look brown, take it up when tender, rub a little butter over it, sprinkle on salt, pepper, and allspice—sprinkle flour over it, and put before the fire, with a Dutch oven over it, or in a brick oven where it will brown quick. Warm up the brains with a little water, butter, salt, and pepper. Add wine and spices if you like. Serve it up as a dressing for the head. Calf's head is also good baked. Halve it, rub butter over it, put it in a pan, with about a quart of water; then cover it with a dressing made of bread soaked soft, a little butter, an egg, and season it with salt, pepper, and powdered mace. Slice up the brains, and lay them in the pan with the head. Bake it in a quick oven, and garnish it with slices of lemon, or force-meat balls.

FORCE-MEAT BALLS.—Chop a pound or two of veal fine; mix it with one or two eggs, a little butter, or raw pork chopped fine; season it with salt and pepper, or curry powder. Do it up into balls about the size of half an egg, and fry them brown.

CALF'S FEET.—Boil them with the head, until tender, then split and lay them round the head, or dredge them with flour after they have been boiled tender, and fry them brown. If you wish for gravy for them, when you have taken them up, stir a little flour into the fat they were fried in; season it with salt, pepper, and mace. Add a little butter and wine if you like, then turn it over the feet.

CALF'S LIVER AND HEART are good broiled or fried. Some people like the liver stuffed and baked.

A FILLET OF VEAL.—Cut off the shank of a leg of veal, and cut gashes in the remainder. Make a dressing of bread, soaked soft in cold water, and mashed; season it with salt, pepper, and sweet herbs; chop a little raw pork fine, put it in the dressing, and if you have not pork, use a little butter instead. Fill the gashes in the meat with part of the dressing, put it in a bake-pan, with just water enough to cover it; put the remainder of the dressing on top of the meat, and cover it with a heated bake-pan lid. For six pounds of veal, allow two hours' steady baking. A leg of veal is nice prepared in this manner, and roasted.

LAMB.—The fore and hind quarters are good roasting pieces. Sprinkle salt and pepper on the lamb, turn the bony side toward the fire first; if not fat, rub a little butter on it, and put a little in the dripping-pan; baste it frequently. These pieces are good stuffed like a fillet of veal, and roasted. The leg is also good, cooked in the same manner; but it is better boiled with a pound of salt pork. Allow fifteen minutes' boiling to each pound of meat. The breast of lamb is good roasted, broiled, or corned and boiled; it is also good made into a pot-pie. The forequarter, with the ribs divided, is good broiled. The bones of this, as well as of all kinds of meat, when put down to broil, should first be put toward the fire, and browned before the other side is broiled. A little salt, pepper, and butter, should be put on it when you take it up. Lamb is very apt to spoil in warm weather. If you wish to keep a leg several days, put it in brine. It should not be put with pork, as fresh meat is apt to injure it. Lamb's head, feet, and heart are good, boiled till tender, then cut off the flesh from the head, cut up the heart, and split the feet in two; put the whole into a pan, with a pint of the liquor they were boiled in, together with a little butter, pepper, salt, and half a teacupful of tomato catsup; thicken the gravy with a little flour; stew the whole for a few moments. Pepper-grass or parsley is a pretty garnish for this dish.

LAMB'S FRY.—The heart and sweetbread are nice fried plainly, or dipped into a beaten egg and fine bread crumbs. They should be fried in lard or butter, or half and half.

TURKEY.—Take out the inwards, wash both the inside and outside of the turkey.

Prepare a dressing made of bread soaked soft in cold water (the water should be drained from the bread, and the bread mashed fine). Melt a small piece of butter, and mix it with the dressing, or else put in salt pork chopped fine; season it with salt and pepper; add sweet herbs if you like. An egg in the dressing makes it cut smoother. Any kind of cooked meat is nice minced fine, and mixed with the dressing. If the inwards are used, they ought to be boiled very tender, as it is very difficult to cook them through while the turkey is ro.sting. Fill the crop and body of the turkey with the dressing, sew it up, tie up the legs and wings, rub on a little salt and butter. Roast it from two to three hours, according to its size; twenty-five minutes to every pound is a good rule. The turkey should be roasted slowly at first, and basted frequently. A little water should be put into the dripping-pan, when the meat is put down to roast. For a gravy to the turkey, take the liquor that the inwards are boiled in, put into it a little of the turkey drippings, set it where it will boil, thicken it with a little flour and water previously mixed smooth. Season it with salt, pepper, and sweet herbs if you like. Drawn butter is used for boiled turkey. A turkey for boiling should be prepared in the same manner as one for roasting. If you wish to have it look white, tie it up in a cloth, unless you boil rice in the pot. If rice is used, put in two-thirds of a teacupful. A pound or two of salt pork, boiled with the turkey, improves it. If you wish to make a soup of the liquor in which the turkey is boiled, let it remain until the next day, then skim off the fat. Heat and season it.

Goose.—If a goose is tender under the wing, and you can break the skin easily by running the head of a pin across the breast, there is no danger of its being tough. A goose should be dressed in the same manner and roasted the same length of time as a turkey.

Chickens.—Chickens for roasting or boiling should have a dressing prepared like that for turkeys. Half a teacupful of rice boiled with the chickens makes them look white. They will be less liable to break if the water is cold when they are put in. A little salt pork boiled with the chickens improves them. If you do not boil pork with them they will need salt. Chickens for broiling should be split, the inwards taken out, and the chicken washed inside and out. Put the bony side down on the gridiron, and broil it very slowly until brown, then turn it, and brown it on the other side. About forty minutes is required to broil a common-sized chicken. For roast chicken, boil the livers and gizzards by themselves, and use the water for gravy to the chickens; cut the inwards in slices, and put them in the gravy.

Fricassee.—The chickens should be jointed, the inwards taken out, and the chickens washed. Put them in a stew-pan with the skin side down; on each layer sprinkle salt and pepper; put in three or four slices of pork, just cover them with water, and let them stew till tender. Then take them up, mix a little flour and water together, and thicken the liquor they were stewed in; add a piece of butter of the size of a hen's egg, then put the chickens back in the stew-pan, and let them stew four or five minutes longer. When you have taken up the chickens, soak two or three slices of toast in the gravy, then put them in your platter, lay the chickens over the toast, and turn the gravy on them. If you wish to brown the chickens, stew them without the pork till tender, then fry the pork brown, take it up, put in the chickens, and then fry until a light brown.

Pigeons.—Take out the inwards, and stuff the pigeons with a dressing prepared like that for turkeys; lay them in a pot with the breast side down. Turn in more than enough water to cover them. When stewed nearly tender, put in a quarter of a pound of butter to every dozen of pigeons—mix two or three teaspoonfuls of flour with a little water, and stir into the gravy. If you wish to brown them, put on a heated bake-pan lid, an hour before they are done, or else take them up when tender, and fry them in pork fat. They are very good split open and stewed, with a dressing made and warmed up separately with a little of the gravy. Tender pigeons are good stuffed and roasted. It takes about two hours to cook tender pigeons, and three hours tough ones. Roast pigeons should be buttered when put to the fire.

Ducks.—Are good stewed like pigeons, or roasted. Two or three onions in the dressing of wild ducks takes out the fishy taste they are apt to have. If ducks or any other fowls are slightly injured by being kept long, dip them in weak saleratus water before cooking them.

Baked or Roast Pig.—A pig for roasting or baking should be small and fat. Take out the inwards, and cut off the first joint

of the feet, and boil them till tender, then chop them. Prepare a dressing of bread soaked soft, the water squeezed out and the bread mashed fine; season it with salt, pepper, and sweet herbs, add a little butter, and fill the pig with the dressing. Rub a little butter on the outside of the pig, to prevent its blistering. Bake or roast it from two hours and a half to three hours. The pan that the pig is baked in should have a little water in it. When cooked, take out a little of the dressing and gravy from the pan, mix it with the chopped inwards and feet, put in a little butter, pepper, and salt, and use this for a sauce to the pig. Expose the pig to the open air two or three minutes before it is put on the table, to make it crispy.

Sweetbread, Liver, and Heart.—A very good way to cook the sweetbread is to fry three or four slices of pork till brown, then take them up and put in the sweetbread, and fry it over a moderate fire. When you have taken up the sweetbread, mix a couple of teaspoonfuls of flour with a little water, and stir it into the fat—let it boil, then turn it over the sweetbread. Another way is to parboil them, and let them get cold, then cut them in pieces about an inch thick, dip them in the yolk of an egg and fine bread crumbs, sprinkle salt, pepper, and sage on them before dipping them in the egg; fry them a light brown. Make a gravy after you have taken them up, by stirring a little flour and water mixed smooth into the fat, and spices and wine if you like. The liver and heart are good cooked in the same manner, or broiled.

Tripe.—After being scoured, should be soaked in salt and water seven or eight days, changing the water every other day; then boil it till tender, which will take eight or ten hours. It is then fit for broiling, frying, or pickling. It is pickled in the same manner as souse.

Sausages.—Chop fresh pork very fine, the lean and fat together (there should be rather more of the lean than the fat), season it highly with salt, pepper, sage, and other sweet herbs, if you like them—a little saltpetre tends to preserve them. To tell whether they are seasoned enough, do up a little into a cake, and fry it. If not seasoned enough, add more seasoning, and fill your skins, which should be previously cleaned thoroughly. A little flour mixed in with the meat tends to prevent the fat from running out when cooked. Sausage-meat is good done up in small cakes and fried. In summer, when fresh pork can not be procured, very good sausage-cakes may be made of raw beef, chopped fine with salt pork, and seasoned with pepper and sage. When sausages are fried, they should not be pricked, and they will cook nicer to have a little fat put in the frying-pan with them. They should be cooked slowly. If you do not like them very fat, take them out of the pan when nearly done, and finish cooking them on a gridiron. Bologna sausages are made of equal weight each of ham, veal, and pork, chopped very fine, seasoned high, and boiled in casings till tender, then dried.

Ham.—A ham that weighs ten pounds should be boiled four or five hours; if very salt, the water should be changed. Before it is put on the table, take off the rind. If you wish to ornament it, put whole cloves, or pepper, in the form of diamonds, over it. The Virginia method of curing hams (which is considered very superior), is to dissolve two ounces of saltpetre, two teaspoonfuls of saleratus, in a salt pickle, as strong as possible, for every sixteen pounds of ham. Add molasses in the proportion of a gallon to a hogshead of brine, then put in the hams, and let them remain three or four weeks. Then take them out of the brine, and smoke them with the hocks downward, to preserve the juices. They will smoke tolerably well in the course of a month, but they will be much better to remain in the smoke-house two or three months. Hams cured in this manner are very fine flavored, and will keep good a long time.

Tongues. — Cut off the roots of the tongues; they are not good smoked, but they make nice pies. Take out the pipes and veins, boil them till tender, mince them fine, season the meat with salt, cloves, mace, and cinnamon, put in a little sugar and molasses, moisten the whole with brandy, put it in a cool place, and it will keep good several months in cold weather, and is good to make pies of at any time, with the addition of apples chopped fine and a little melted butter. For the remainder of the tongues, make a brine in the following manner—to a gallon of cold water put a quart of rock salt, an ounce of saltpetre, quarter of a pound of sugar, and couple of tablespoonfuls of blown salt. Put in the tongues, let them remain in it a week, and then smoke them eight or ten days.

Chicken Pie.—Joint the chickens, which should be young and tender. Boil them in

just sufficient water to cover them. When nearly tender take them out of the liquor, and lay them in a deep pudding-dish, lined with pie crust. To each layer of chicken put three or four slices of pork, add a little of the liquor in which they were boiled, and a couple of ounces of butter cut into small pieces—sprinkle a little flour over the whole, cover it with nice pie crust, and ornament the top with some of your pastry. Bake it in a quick oven one hour.

Beef and Mutton Pie.—Take tender meat, pound it out thin, and broil it ten minutes—then cut off the bony and gristly parts, season it highly with salt and pepper, butter it, and cut it into small pieces. Line a pudding dish with pastry, put in the meat, and to each layer add a teaspoonful of tomato catsup, together with a tablespoonful of water—sprinkle over flour, and cover it with pie crust, and ornament as you please with pastry. Cold roast or boiled beef and mutton make a good pie, by cutting them into bits, and seasoning them highly with salt and pepper. Put them into a pie dish, turn a little melted butter over them, or gravy, and pour in water till you can just see it at the top.

Chicken and Veal Pot-Pie.—If the pie is to be made of chickens, joint them—boil the meat until about half done. Take the meat out of the liquor in which it was boiled, and put it in a pot, with a layer of crust to each layer of meat, having a layer of crust on the top. The meat should be seasoned with salt and pepper—cover the whole with the boiled meat liquor. If you wish to have the crust brown, keep the pot covered with a heated bake-pan lid. Keep the teakettle of boiling water to turn in as the water boils away—cold water makes the crust heavy. The crust for the pie is good like that made for fruit pies, with less shortening, but raised pie crust is generally preferred to any other. It is made in the following manner: mix together three pints of flour, a teacupful of melted butter, a teaspoonful of salt, then turn in the necessary yeast—add cold water to make it sufficiently stiff to roll out. Set it in a warm place to rise, which will take seven or eight hours, unless yeast cake is used. When risen, roll it out and cut it into small cakes. Potato pie crust is very nice. To make it, boil eight or nine small potatoes, peel and mash them fine, mix with them a piece of butter of the size of a hen's egg, a teaspoonful of salt, a tumblerful of milk, and flour to render it of the right consistency to roll out. When rolled out, cut them into cakes, and put them with the meat. If you happen to have unbaked wheat dough, very good crust may be made of it by working into it a little lukewarm melted butter. Let it remain, after you have rolled and cut it into cakes, about ten or fifteen minutes, before putting it with the meat.

Warmed-over Meats.—Boiled or roasted veal makes a nice dish, chopped fine, and warmed up, with just sufficient water to moisten it, and a little butter, salt, and pepper added. A little nutmeg and the grated rind of a lemon improve it—none of the white part of the lemon should be used. When well heated through, take it up on a platter, and garnish it with a couple of lemons cut in slices. Fresh or corned beef is good minced fine, with boiled potatoes, and warmed up with salt, pepper, and a little water—add butter, just before you take it up. Some people use the gravy that they have left the day before, for the meat, but it is not as good when warmed over, and there is no need of its being wasted, as it can be clarified and used for other purposes. Boiled onions, or turnips, are good mixed with mince-meat, instead of potatoes. Veal, lamb, and mutton are good cut into small strips, and warmed with boiled potatoes cut in slices, pepper, salt, a little water—add butter just before you take it up. Roast beef and mutton, if not previously cooked too much, are nice cut in slices, and just scorched on a gridiron. Meat, when warmed over, should be on the fire just long enough to get well heated through—if on the fire long, most of the juices of the meat will be extracted, and render it very indigestible. Cold fowls are nice jointed, and warmed with a little water, then taken up and fried in butter till brown. A little flour should be sprinkled on them before frying. Thicken the water that the fowls were warmed in—add a little salt, pepper, and butter, and turn it over the fowls.

Drawn Butter.—Mix two or three teaspoonfuls of flour with a little cold water—stir it till free from lumps, thin it, and stir it into half a pint of boiling water—let it boil two or three minutes, then cut up about a quarter of a pound of butter into small pieces, and put it with the flour and water—set it where it will melt gradually. If carefully mixed, it will be free from lumps—if not, strain it before it is put on the table. If the butter is to be eaten on fish,

cut up several soft boiled eggs into it. A little curry powder sprinkled into it will convert it into curry sauce.

BURNED BUTTER.—Put a couple of ounces of butter into a frying pan—set it on fire—when of a dark brown color, put in half a teacupful of vinegar, a little pepper and salt. This is nice for fish, salad, or eggs.

ROAST MEAT GRAVY.—Meat, when put down to roast, should have about a pint of water in the dripping pan. A little while before the meat is done, stir up the drippings, put it in a skillet, and set it where it will boil. Mix two or three teaspoonfuls of flour smoothly with a little water, and stir it in the gravy when it boils. Lamb and veal require a little butter in the gravy. The gravy for pork and geese should have a little of the dressing and sage mixed with it. If you wish to have your gravies look dark, scorch the flour that you thicken them with, which is easily done by putting it in a pan, setting it on a few coals, and stirring it constantly till it is a dark brown color, taking care that it does not burn. Enough can be burned at once to last a long time.

SAUCE FOR COLD MEAT, FISH, OR SALAD.—Boil a couple of eggs three minutes; then mix it with a mustard-spoonful of made mustard, a little salt, pepper, half a teacupful of salad oil or melted butter, and half a teacupful of vinegar. A tablespoonful of catsup improves it.

WINE SAUCE FOR VENISON OR MUTTON.—Warm half a pint of the drippings or liquor the meat was boiled in, mix a couple of teaspoonfuls of scorched flour with a little water, and stir it in when the gravy boils. Season it with salt, pepper, and cloves; stir a tablespoonful of currant jelly in, and, just before you take it from the fire, half a tumbler of wine. Many people prefer melted currant jelly to any other sauce for venison or mutton.

OYSTER SAUCE.—Take the juice of the oysters, and to a pint put a couple of sticks of mace, a little salt and pepper. Set it on the fire; when it boils, stir in a couple of teaspoonfuls of flour, mixed with milk. When it has boiled several minutes, stir in half a pint of oysters, a piece of butter of the size of a hen's egg. Let them scald through, then take them up.

WHITE CELERY SAUCE FOR BOILED POULTRY.—Take five or six heads of celery, cut off the green tops, cut up the remainder into small bits, and boil it tender in half a pint of water; mix two or three teaspoonfuls of flour smoothly with a little milk; and then add half a teacupful more of milk, stir it in, add a small lump of butter and a little salt. When it boils, take it up.

BROWN SAUCE FOR POULTRY.—Peel two or three onions, cut them in slices, flour and fry them brown in a little butter; then sprinkle in a little flour, pepper, salt, and sage; add half a pint of the liquor the poultry was boiled in, and a tablespoonful of catsup. Let it boil up; then stir in half a wineglassful of wine if you like.

SAVORY JELLY FOR COLD MEAT.—Boil lean beef or veal till tender. If you have any beef or veal bones, crack and boil them with the meat (they should be boiled longer than the meat), together with a little salt pork, sweet herbs, and pepper and salt. When boiled sufficiently, take it off, strain it, and let remain till the next day; then skim off the fat, take up the jelly, and scrape off the dregs that adhere to the bottom of it; put in the whites and shells of several eggs, several blades of mace, a little wine and lemon juice; set it on the fire, stir it well till it boils, then strain it till clear through a jelly bag.

CHICKEN SALAD.—Boil a chicken that weighs not more than a pound and a half. When very tender take it up, cut it in small strips, and make the following sauce, and turn over it: Boil four eggs three minutes; then take them out of the shells, mash and mix them with a couple of tablespoonfuls of olive oil or melted butter, two-thirds of a tumblerful of vinegar, a teaspoonful of mixed mustard, a teaspoonful of salt, a little pepper, and essence of celery if you have it—if not, it can be dispensed with.

APPLE AND CRANBERRY SAUCE.—Pare and quarter the apples—if not tart, stew them in cider—if tart enough, stew them in water. When stewed soft, put in a small piece of butter, and sweeten it to the taste with sugar. Another way, which is very good, is to boil the apples, without paring them, with a few quinces and molasses, in new cider, till reduced to half the quantity. When cool, strain the sauce. This kind of sauce will keep good several months. It makes very good plain pies, with the addition of a little cinnamon or cloves. To make cranberry sauce, nothing more is necessary than to stew the cranberries till soft, then stir in sugar and molasses to sweeten it. Let the sugar scald in it a few minutes. Strain it if you like—it is very good without straining.

PUDDING SAUCE.—Stir to a cream a teacupful of butter, with two of brown sugar, then add a wineglassful of wine or cider; flavor it with nutmeg, rose-water, or essence of lemon. If you wish to have it liquid, heat two-thirds of a pint of water boiling hot, mix two or three teaspoonfuls of flour with a little water and stir it into the boiling water. As soon as it boils up well, stir it into the butter and sugar.

MUSHROOM CATSUP.—Put a layer of fresh mushrooms in a deep dish, sprinkle a little salt over them, then put in another layer of fresh mushrooms and salt, and so on till you get in all the mushrooms. Let them remain several days; then mash them fine, and to each quart put a tablespoonful of vinegar, half a teaspoonful of black pepper, and a quarter of a teaspoonful of cloves; turn it into a stone jar, set the jar in a pot of boiling water and let it boil two hours, then strain it without squeezing the mushrooms. Boil the juice a quarter of an hour, skim it well, let it stand a few hours to settle, then strain it off carefully through a sieve, bottle and cork it tight. Keep it in a cool place.

WALNUT CATSUP.—Procure the walnuts by the last of June; keep them in salt and water for a week, then bruise them, and turn boiling vinegar on them. Let them remain covered with vinegar for several days, stirring them up each day; then boil them a quarter of an hour with a little more vinegar, strain them through a thick cloth, so that none of the coarse particles of the walnuts will go through; season the vinegar highly with cloves, allspice, pepper, and salt. Boil the whole a few minutes, bottle and cork it tight. Keep it in a cool place.

PLAIN VEAL SOUP.—A leg of veal, after enough has been cut off for cutlets, makes a soup nearly as good as calf's head. Boil it with a cup two-thirds full of rice, and a pound and a half of pork; season it with salt, pepper, and sweet herbs, if you like. A little celery boiled in it gives the soup a fine flavor. Some people like onions, carrots, and parsley boiled in it. If you wish for balls in the soup, chop veal and a little raw salt pork fine; mix it with a few bread crumbs and a couple of eggs. Season it with salt and pepper; add a little curry powder if you like—do it up into small balls and boil them in the soup. The veal should be taken up before the soup is seasoned. Just before the soup is taken up, put in a couple of slices of toast, cut into small pieces. If you do not like your soup fat, let the liquor remain till the day after you have boiled the meat, and skim off the fat before heating the liquor. The shoulder of veal makes a good soup.

MOCK TURTLE, OR CALF'S HEAD SOUP.—Boil the head until perfectly tender, then take it out, strain the liquor, and set it away until the next day, then skim off the fat, cut up the meat, together with the lights, and put it into the liquor, put it on the fire, and season it with salt, pepper, cloves, and mace, add onions and sweet herbs if you like; stew it gently for half an hour. Just before you take it up, add half a pint of white wine. For the balls, chop lean veal fine, with a little salt pork, add the brains, and season it with salt, pepper, cloves, mace, sweet herbs, or curry powder, make into balls about the size of half an egg, boil part in the soup, fry the remainder, and put them in a dish by themselves.

BEEF OR BLACK SOUP.—The shank of beef is the best part for soup—cold roast beef bones and beefsteak make very good soup. Boil the shank four or five hours in water enough to cover it. Half an hour before the soup is put on the table, take up the meat, thicken the soup with scorched flour mixed with cold water, season it with salt, pepper, cloves, mace, a little walnut or tomato catsup improves it, put in sweet herbs or herb spirit if you like. Some cooks boil onions in the soup, but as they are very disagreeable to many persons, it is better to boil and serve them up in a dish by themselves. Make force-meat balls of part of the beef and pork, season them with mace, cloves, pepper and salt, and boil them in the soup fifteen minutes.

CHICKEN OR TURKEY SOUP.—The liquor that a turkey or chicken is boiled in makes a good soup. If you do not like your soup fat, let the liquor remain till the day after the poultry has been boiled in it, then skim off the fat, set it where it will boil. If there was not any rice boiled with the meat, put in half a teacupful when the liquor boils, or slice up a few potatoes and put in—season it with salt and pepper, and sweet herbs, a little celery boiled in it improves it. Toast bread or crackers, and put them in the soup when you take it up.

OYSTER SOUP.—Separate the oysters from the liquor, to each quart of the liquor put a pint of milk or water, set it on the fire with the oysters. Mix a heaping tablespoonful of flour with a little water, and stir it into the liquor as soon as it boils. Season it with salt, pepper, and a little wal-

nut or butternut vinegar, if you have it; if not, common vinegar may be substituted. Put in a small lump of butter, and turn it as soon as it boils up again on to buttered toast cut into small pieces.

PEA SOUP.—If you make your soup of dry peas soak them over night in a warm place, using a quart of water to each quart of the peas. Early the next morning boil them an hour. Boil with them a teaspoonful of saleratus eight or ten minutes, then take them out of the water they were soaking in, put them into fresh water, with a pound of salt pork, and boil it till the peas are soft, which will be in the course of three or four hours. Green peas need no soaking, and boiling only long enough to have the pork get thoroughly cooked, which will be in the course of an hour.

OMELET.—Beat the eggs to a froth, and to a dozen of eggs put three ounces of finely minced boiled ham, beef, or veal; if the latter meat is used add a little salt. Melt a quarter of a pound of butter, mix a little of it with the eggs—it should be just lukewarm. Set the remainder of the butter on the fire in a frying or tin pan; when quite hot, turn in the eggs beaten to a froth, stir them until they begin to set. When brown on the under side, it is sufficiently cooked. The omelet should be cooked on a moderate fire, and in a pan small enough to have the omelet an inch thick. When you take them up, lay a flat dish on them, then turn the pan upside down.

POACHED EGGS.—Break the eggs into a pan, beat them to a froth, then put them into a buttered tin pan, set the pan on a few coals, put in a small lump of butter, a little salt, let them cook very slowly, stirring them constantly till they become quite thick, then turn them on to buttered toast.

BROILING, BOILING, AND FRYING FISH.—Fish for boiling or broiling are the best the day after they are caught. They should be cleaned when first caught, washed in cold water, and half a teacupful of salt sprinkled on the inside of them. If they are to be broiled, sprinkle pepper on the inside of them—keep them in a cool place. When fish is broiled, the bars of the gridiron should be rubbed over with a little butter, and the inside of the fish put toward the fire, and not turned till the fish is nearly cooked through, then butter the skin side and turn it over; fish should be broiled slowly. When fresh fish is to be boiled, it should either be laid on a fish strainer or sewed up in a cloth; if not, it is very difficult to take it out of the pot without breaking. Put the fish into cold water with the backbone down. To eight or ten pounds of fish, put half of a small teacupful of salt. Boil the fish until you can draw out one of the fins easily—most kinds of fish will boil sufficiently in the course of twenty or thirty minutes; some kinds will boil in less time. Some cooks do not put their fish into water till it boils, but it is not a good plan, as the outside gets cooked too much, and breaks to pieces before the inside is sufficiently done. Fish for frying, after being cleaned and washed, should be put into a cloth to have it absorb the moisture. They should be dried perfectly and a little flour rubbed over them. No salt should be put on them, if you wish to have them brown well. For five or six pounds of fish, fry three or four slices of salt pork; when brown, take them up, and if they do not make fat sufficient to fry the fish in, add a little lard. When the fish are fried enough, take them up; for good plain gravy, mix two or three teaspoonfuls of flour with a little water, and stir it into the fat the fish was fried in, put in a little butter, pepper, and salt; if you wish to have the gravy rich add spices, catsup, and wine; turn the gravy over the fish. Boiled fish should be served up with drawn butter, or liver sauce. Fish. when put on the platter, should not be laid over one another if it can be avoided, as the steam from the under ones makes those on the top so moist that they will break to pieces when served out.

Great care and punctuality are necessary in cooking fish. If not done sufficiently, or if done too much, they are not good. They should be eaten as soon as cooked. For a garnish to the fish, use parsley, a lemon, or eggs boiled hard, and cut in slices.

CHOWDER.—Fry three or four slices of pork till brown, cut each of your fish into five or six slices, flour, and put a layer of them into your pork fat, sprinkle on pepper and a little salt—add cloves, mace, and sliced onions if you like—lay on several bits of your fried pork, and crackers previously soaked soft in cold water. This process repeat till you get in all the fish, then turn on water enough to just cover them—put on a heated bake-pan lid. When the fish have stewed about twenty minutes, take them up and mix a couple of teaspoonfuls of flour with a little water, and stir it into the gravy, also a little butter and pepper. Half a pint of white wine, spices, and catsup will improve it. Bass and cod make the best chowder, blackfish and clams

make a tolerably good one. The hard part of the clams should be thrown away.

Stuffed and Baked Fish.—Soak bread in cold water till soft, drain off the water, mash the bread fine, mix it with a tablespoonful of melted butter, a little pepper and salt—a couple of raw eggs makes the dressing cut smoother—add spices if you like. Fill the fish with the dressing, sew it up, put a teacupful of water in your bake-pan, and a small piece of butter, lay in the fish, bake it from forty to fifty minutes. Fresh cod, bass, and shad are suitable fish for baking.

Fish Cakes.—Cold boiled fresh fish, or salt codfish, is nice minced fine, with potatoes, moistened with a little water, and a little butter put in, done up into cakes the size of common biscuit, and fried brown in pork fat or butter.

Fish Force-Meat Balls.—Take a little uncooked fish, chop it fine, together with a little raw salt pork; mix it with one or two raw eggs, a few bread crumbs, and season the whole with pepper and spices. Add a little catsup if you like, do them up into small balls, and fry them till brown.

Clams.—Wash and put them in a pot, with just water enough to prevent the shells burning at the bottom of the pot. Heat them till the shells open—take the clams out of them, and warm them with a little of the clam liquor, a little salt, butter, and pepper. Toast a slice or two of bread, soak it in the clam liquor, lay it in a deep dish, and turn the clams on to it. For clam pancakes, mix flour and milk together to form a thick batter—some cooks use the clam liquor, but it does not make the pancakes as light as the milk. To each pint of the milk put a couple of eggs and a few clams—they are good taken out of the shells without stewing, and chopped fine, or stewed, and put into cakes whole. Very large long clams are good taken out of the shells without stewing, and broiled.

Stewed Oysters.—Strain the oyster liquor, rinse the bits of shells off the oysters, then turn the liquor back on to the oysters, and put them into a stew-pan—set them where they will boil up, then turn them on to buttered toast—salt, pepper, and butter them to your taste. Some cooks add a little walnut catsup, or vinegar. The oysters should not be cooked until just before they are to be eaten.

To Fry Oysters.—Take those that are large, dip them in beaten eggs, and then in flour or fine bread crumbs—fry them in lard, till of a light brown. They are a nice garnish for fish. They will keep good for several months if fried when first caught, salted and peppered, then put into a bottle, and corked tight. Whenever they are to be eaten, warm them in a little water.

Oyster Pancakes.—Mix equal quantities of milk and oyster juice together. To a pint of liquor when mixed put a pint of wheat flour, a few oysters, a couple of eggs, and a little salt. Drop by the large spoonful into hot lard.

Oyster Pie.—Line a deep pie-plate with pie crust; fill it with dry pieces of bread, cover it over with puff paste; bake it till a light brown, either in a quick oven or bake-pan. Have the oysters just stewed by the time the crust is done; take off the upper crust, remove the pieces of bread, put in the oysters, season them with salt, pepper, and butter. A little walnut catsup improves the pie, but is not essential—cover it with the crust.

Scalloped Oysters.—Pound rusked bread or crackers fine; butter scallop shells or tins, sprinkle on the bread crumbs, then put in a layer of oysters, a small lump of butter, pepper, salt, and a little of the oyster juice; then put on another layer of crumbs and oysters, and so on till the shells are filled, having a layer of crumbs at the top. Bake them till a light brown.

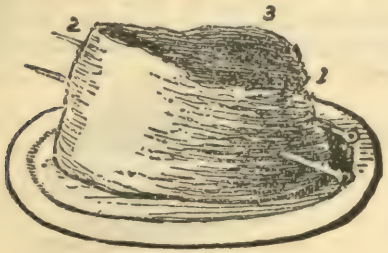
Directions for Pickling.—Vinegar for pickling should be good, but not of the sharpest kind. Brass utensils should be used for pickling. They should be thoroughly cleaned before using, and no vinegar should be allowed to cool in them, as the rust formed by so doing is very poisonous. Boil alum and salt in the vinegar, in the proportion of half a teacupful of salt and a tablespoonful of alum to three gallons of vinegar. Stone and wooden vessels are the only kind of utensils that are good to keep pickles in. Vessels that have had any grease in will not do for pickles, as no washing will kill the grease that the pot has absorbed. All kinds of pickles should be stirred up occasionally. If there are any soft ones among them, they should be taken out, the vinegar scalded, and turned back while hot—if very weak, throw it away and use fresh vinegar. Whenever any scum rises, the vinegar needs scalding. If you do not wish to have all your pickles spiced, it is a good plan to keep a stone pot of spiced vinegar by itself, and put in a few of your pickles a short time before they are to be eaten.

HINTS ON CARVING

CARVING presents no difficulties; it simply requires knowledge. All displays of exertion or violence are in very bad taste; for, if not proved an evidence of the want of ability on the part of the carver, they present a very strong testimony of the toughness of a joint.

Lightness of hand and dexterity of management are necessary, and can only be acquired by practice. In addition to the skill in the use of the knife, there is also required another description of knowledge, and that is an acquaintance with the best part of the joint, fowl or fish being carved. Thus in a haunch of venison the fat should be served with each slice; in the shoulder of mutton there are some delicate cuts in the under part. The breast and wings are the best part of a fowl, and the trail of a woodcock on a toast is the choicest part of the bird. The list, however, is too numerous to mention here; and, indeed, the knowledge can only be acquired by experience. In the following directions, accompanied by diagrams, we have endeavored to be as explicit as possible; but while they will prove as landmarks to the uninitiated, he will find that practice alone will enable him to carve with skill and facility.

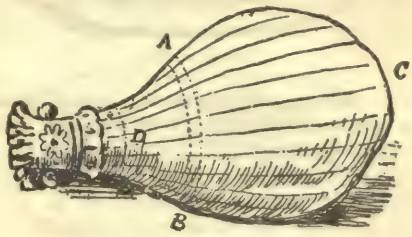
AN AITCH-BONE OF BEEF.—This is a simple joint to carve, but the slices from it must be cut quite even, and of a very moderate thickness. When the joint is boiled, before cutting to serve, remove a slice from the whole of the upper part of sufficient thickness, say a quarter of an inch, in order to arrive at the juicy part of the meat at once. Carve from 1 to 2; let the slices be moderately thin—not too



Aitch Bone

thin; help fat with the lean in one piece, and give a little additional fat which you will find below 3; the solid fat is at 1, and must be cut in slices horizontally. The round of beef is carved in the same manner.

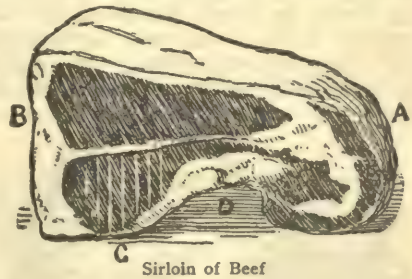
HAM.—It is served as placed in the engraving, and should come to the table



Ham

ornamented. Carve from A to B, cutting thin slices slantingly, to give a wedge-like appearance. Those who prefer can carve the hock at D, in the same direction as from A to B, then carve from D to C, in thin slices, as indicated in the diagram.

THE SIRLOIN OF BEEF.—The under part should be first served, and carved as indi-



Sirloin of Beef

cated in the engraving, across the bone. In carving the upper part the same directions should be followed as for the ribs, or in the centre, from A to B, and helping the fat from D.

SUCKING PIG.—The cook should send a roast pig to table garnished with head and ears. Carve the joints, then divide the ribs, serve with plenty of sauce; should one of the joints be too much, it may be separated; bread sauce and stuffing should accompany it.

BOILED TONGUE.—Carve across the tongue, but do not cut through; keep the slices rather thin, and help the fat from underneath.

Brisket of Beef must be carved in the direction 1 and 2 quite down to the bone,



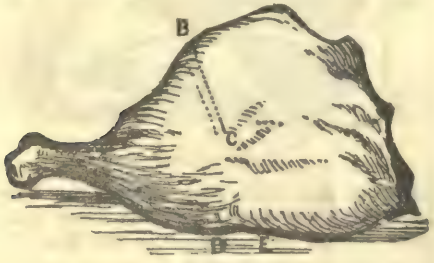
Brisket of Beef

after cutting off the outside, which should be about three-quarters of an inch thick.

Ribs of Beef are carved similar to the sirloin, commencing at the thin end of the joint, and cutting long slices, so as to assist fat and lean, at the same time.

Round or Buttock of Beef.—Remove the upper surface in the same manner as for an aitch-bone of beef, carve thin horizontal slices of fat and lean, as evenly as possible. It requires a sharp knife and steady hand to carve it well.

Leg of Mutton.—The under or thickest part of the leg should be placed uppermost, and carved in slices moderately thin, from B to C. When cold the back of the leg should be placed uppermost, and thus carved; if the cramp bone is requested, and some persons regard it as a dainty, hold the shank with your left hand, and



Leg of Mutton

insert your knife at D, passing it round to E, and you will remove it.

Ribs of Beef.—There are two modes of carving this joint. The first, which is now becoming common, and is easy to an amateur carver, is to cut across the bone, commencing in the centre, and serving fat from A, as marked in the engraving of the sirloin; or it should be carved in slices from A to C, commencing either in the centre of the joint or at the sides. Occasionally the bones are removed, and the meat formed into a fillet; it should then be carved as a round of beef.

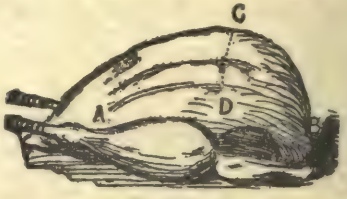
The Loin of Mutton, if small, should be carved in chops, beginning with the outer chop; if large, carve slices the whole length. A neat way is to run the knife along the chine bone and under the meat along the ribs; it may then be cut in slices; and by this process fat and lean are served together. Your knife should be very sharp, and it should be done cleverly.

Neck of Mutton, if the scrag and chine bone are removed, is carved in the direction of the bones.

The Scrag of Mutton should be separated from the ribs of the neck, and when roasted the bone assisted with the meat.

Haunch of Mutton is carved as haunch of venison.

Roast Fowl.—This operation is a nice and skilful one to perform; it requires



Roast Fowl

both observation and practice. Insert the knife between the legs and the side, press back the leg with the blade of the knife, and the joint will disclose itself; if young, it will part, but at best, if judiciously managed, will require but a nick where the joints unite. Remove your wing from D to B, cut through and lay it back as with the leg, separating the joint with the edge of your knife, remove the merrythought and neck bones next; this you will accomplish by inserting the knife and forcing it under the bones; raise it, and it will readily separate from the breast. You will divide the breast from the body by cutting



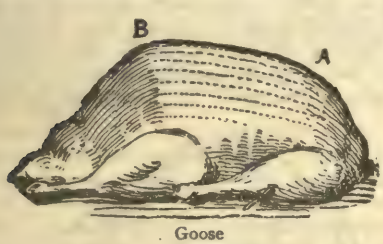
Carving Roast Fowl

through the small ribs down to the vent, turn the back uppermost, now put your

knife into about the centre between the neck and rump, raise the lower part firmly yet gently, it will easily separate; turn the neck or rump from you, take off the side bones and the fowl is carved.

In separating the thigh from the drumstick, you must insert the knife exactly at the joint, as we have indicated in the engraving; this, however, will be found to require practice, for the joint must be accurately hit, or else much difficulty will be experienced in getting the parts asunder. There is no difference in carving roast and boiled fowls, if full grown; but in a very young fowl when roasted, the breast is served whole. The wings and breast are in the highest favor, but the leg of a young fowl is an excellent part.

GEESE.—Follow with your knife the lines marked in the engraving, A to B, and cut slices, then remove the wing, and if the party be large, the legs must also be removed, and here the *disjointer* will again prove serviceable. The stuffing, as in the



Goose

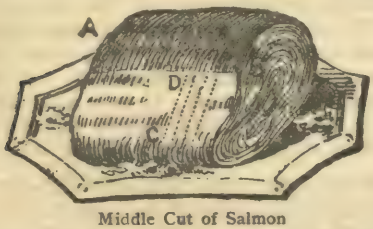
turkey, will be obtained by making an insertion at the apron.

GUINEA FOWL are carved in the same manner.

GROUSE AND PLOVER are carved as partridges.

SNIPE AND WOODCOCK are divided into two parts; the trail being served on a toast.

FISH should never be carved with steel; serving requires more care than knowl-



Middle Cut of Salmon

edge; the principal caution is to avoid breaking the flakes. In carving a piece of salmon as here engraved, cut thin slices, as from A to B, and help with it pieces of the belly in the direction marked from C to D. The best flavored is the upper or thick part.

HADDOCK.—It is dressed whole, unless unusually large. When sent to the table it is split its whole length, and served one-half the head to the tail of the other part; it is carved across.

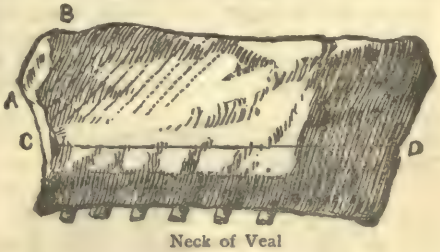
MACKEREL should always be sent to table head to tail. Divide the meat from the



Mackerel

bone by cutting down the back lengthwise from 1 to 2; upper part is the best. All small fish, such as herrings, smelts, etc., are served whole.

NECK OF VEAL.—Were you to attempt to carve each chop and serve it, you would not only place a gigantic bit upon the plate of the person you intended to help, but you would waste time, and if the vertebræ had not been jointed by the butcher you would find yourself in the position of the ungraceful carver, being compelled to exercise a degree of strength

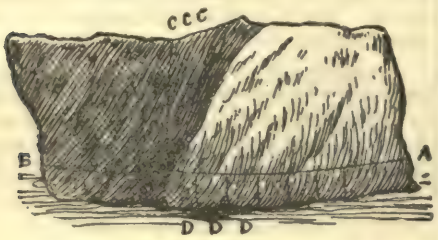


Neck of Veal

which should never be suffered to appear; very possibly, too, assisting gravy in a manner not contemplated by the person unfortunate enough to receive it. Cut diagonally from B to A, and help in slices of moderate thickness; you can cut from C to D in order to separate the small bones; divide and serve them, having first inquired if they are desired.

THE BREAST OF VEAL.—Separate the ribs from A to B; these small bones, which are the sweetest and mostly chosen, you will

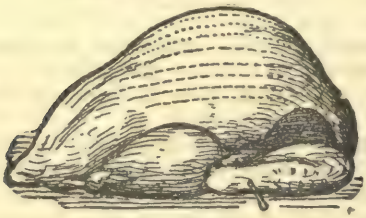
cut them as D D D, and serve. The long ribs are divided as at C C C; and having



Breast of Veal

ascertained the preference of the person, help accordingly.

BOILED TURKEY is trussed in a different fashion to the roast, but the same directions given for the first apply to the second. The legs in the boiled turkey being


Boiled Turkey

drawn into the body may cause some little difficulty at first in their separation, but a little practice will soon surmount it.

FILLET OF VEAL.—Cut a slice off the whole of the upper part in the same way as from a round of beef; this being, if well roasted, of a nice brown, should be helped in small pieces with the slices you

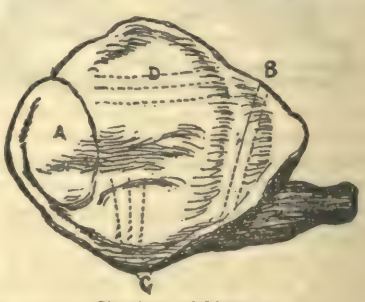

Fillet of Veal

cut for each person. The stuffing is skewered in the flap, and where the bones come out there is some placed; help this with the meat, with a piece of the fat.

LOIN OF VEAL.—This joint is sent to table served as a sirloin of beef. Having turned it over, cut out the kidney and the aft, return it to its proper position, and carve it as in the neck of veal, from B to A; help with it a slice of kidney and fat. The kidney is usually placed upon a dry toast when removed from the joint.

SHOULDER OF VEAL is sent to table with the under part placed uppermost. Help it as a shoulder of mutton, beginning at the knuckle end.

A SHOULDER OF MUTTON.—This is a joint upon which a great diversity of opinion exists, many professing a species of horror at its insipidity, others finding much delicacy of flavor in certain parts. In good mutton there is no doubt but that, if properly managed, it is an excellent joint, and, if judiciously served, will give satisfaction to all who partake of it. It should be served hot. It is sent to table lying on the dish as shown in the annexed engraving. Commence carving from A to B, taking out moderately thin slices in the shape of a wedge; some nice pieces may then be helped from the blade bone, from C to B, cutting on both sides of the bone. Cut the fat from D, carving it in thin slices. Some of the most delicate parts, however,



Shoulder of Mutton

lie on the under part of the shoulder; take off thin pieces horizontally from B to C, and from A; some tender slices are to be met with at D, but they must be cut through as indicated.

The shoulder of mutton is essentially a joint of titbits, and therefore, when carving it, the tastes of those at the table should be consulted. It is a very insipid joint when cold, and should therefore be hashed if sent to table a second time.

WILD DUCK AND WIDGEON.—The breast of these fowls, being the best portion, is carved in slices, which being removed, a glass of old port made hot is poured in, the half of a lemon seasoned with cayenne

and salt should then be squeezed in, the slices relaid in their places, and then served, the joints being removed the same as in other fowl.

Partridge.—Separate the legs, and then divide the bird into three parts, leaving each leg and wing together. The breast is then divided from the back, and helped whole, the latter being assisted with any of the other parts. When the party consists of gentlemen only, the bird is divided into two by cutting right through from the vent to the neck.

Pigeon.—Like woodcock, these birds are cut in half, through the breast and back, and helped.

Roast Turkey.—Cut long slices from both sides of the breast down to the ribs at the breast-bone. If a large bird the legs may be removed, and the drumsticks taken off. The stuffing may be removed by making an incision in the apron.

Boiled Fowl.—There is but little difference in the mode of carving roast and boiled fowl, and that little lies in the breast of the former being generally served entire—the thigh-bone, too, is preferred by many to the wing.

HINTS ON BREAD MAKING

For Use in the Morning.—For five or six pounds of flour to a baking. Sift your flour into a bowl. Draw it to the edges of the bowl, leaving a well in the middle, and leaving about two inches of flour covering the bottom of the well. Dissolve *thoroughly* one cake of compressed yeast in a teacupful of lukewarm water, and add same to one and one-half pints of lukewarm water, and pour the liquid into the well in your flour. Stir in—from the wall of flour surrounding the well—sufficient flour to make a sponge considerably thicker than griddle-cake batter. Beat the sponge thoroughly; dust a little flour over it; cover with a cloth, and set in a moderately warm place, free from draught, to rise. As soon as it has risen well—which will be indicated by the covering of flour becoming cracked and air bubbles coming through the cracks—stir the sponge down; add one tablespoonful of salt and about one pint of lukewarm water, and make a moderately stiff dough. *Care should be exercised not to take sponge or dough before they are ready.* Knead well and set to rise. When thoroughly light, make into loaves and set them to rise, and when well risen bake in a moderately quick oven. *Remember*, the loaves will spring still more in the oven. When baked, lean the loaves against something; cover with a cloth, and cool by contact with the air on all sides.

Quick Method.—To about three and one-half pounds of sifted flour add two teaspoonfuls of salt and mix thoroughly together. Then dissolve two cakes of compressed yeast in one pint of lukewarm water, and add another pint of lukewarm water to it. See that the water is *not hot.* Pour the water and yeast over the flour, and make a moderately stiff dough. Knead thoroughly, and set in a warm place to rise. When well risen, mold into loaves; let them rise, and then bake.

Potatoes, and same quantity of butter, or lard and sugar, as of salt, may be used with either of the foregoing recipes.

For Use at Night.—Dissolve *thoroughly* one cake of compressed yeast in a small teacupful of lukewarm water, and add same to from one pint to one quart of water—lukewarm in winter and cold in summer. Then add from one to two teaspoonfuls each of salt, sugar, and lard—according to the quantity of water used—and stir in sifted flour enough to make a moderately stiff dough. Knead thoroughly, cover with a cloth, and set in a moderately warm place, free from draught, to rise. In the morning, make into loaves and set them to rise. When well risen, bake in a moderately quick oven. When baked, lean the loaves against something, cover with a cloth, and cool by contact with the air on all sides. Sugar and lard may be left out if desired.

Biscuits.—Either of the above processes, with shortening to suit, will produce *fine light* biscuits or breakfast rolls.

Sponge Bread.—For four loaves of bread, take three quarts of wheat flour and the same quantity of boiling water; mix them well together. Let it remain till lukewarm, then add a teacupful of family or half a teacupful of distillery yeast. Set it in a warm place to rise. When light, knead in flour till stiff enough to mold up, then let it stand till risen again before molding it up.

Tea Rolls.—Take two quarts of sifted

flour, a yeast cake dissolved in lukewarm milk, a heaping teaspoonful of salt, two tablespoonfuls of powdered sugar, two-thirds of a cup of butter, and lukewarm milk enough to make a moderately stiff dough. Set to rise about 2 P.M. When well risen, make into rolls and set them to rise. Twenty minutes to half an hour, in a quick oven, will be sufficient to bake.

If wanted for breakfast, set overnight with a half cake of yeast.

BUCKWHEAT CAKES.—Dissolve one cake of compressed yeast in one pint of lukewarm milk or water. Rub together one tablespoonful of wheat flour, one tablespoonful of molasses or sugar, and half a teaspoonful of salt. Add to this the milk or water containing the dissolved yeast, and rub until perfectly smooth, and then stir in one pint of lukewarm milk or water. To this add sufficient buckwheat flour—about one quart—to make thin batter, which should be rubbed perfectly smooth. Set the batter in a moderately warm place to rise overnight. In the morning, thin, if necessary, and fry on well-greased griddle.

QUICK PROCESS.—Dissolve one cake of compressed yeast in one and one-half pints of lukewarm milk or water, and add one teaspoonful of salt, a handful of wheat flour, a tablespoonful of molasses, and buckwheat flour enough to make ordinary batter. Set in a warm place to rise. *Will be ready for baking in about thirty minutes.*

WHEAT GRIDDLE CAKES.—Dissolve one cake of compressed yeast in one pint of lukewarm milk or water. Rub together one tablespoonful each of butter, white Indian meal and sugar, and add two eggs, well beaten, and a little salt. Into this stir the milk or water containing the dissolved yeast, and add sufficient wheat flour, sifted, to make thin batter. Let it stand in a moderately warm place for thirty minutes. If too thick, thin with lukewarm milk or water, and fry on well-greased griddle. *Ready in thirty minutes.*

EXCELLENT BATTER CAKES WITHOUT EGGS.—Dissolve one cake of compressed yeast in a cupful of lukewarm milk. Put into your mixing bowl two heaping cupfuls of flour, four tablespoonfuls of melted lard, four tablespoonfuls of syrup, a little salt, and two cupfuls of milk or water—or milk and water mixed. Add the water containing the dissolved yeast, and mix until a smooth batter is produced. Set in a moderately warm place, cover with a cloth, and let it rise overnight. In the morning beat well, and fry on well-greased griddle.

GRAHAM BREAD.—To one quart of Graham flour, one teacupful of rye flour, one teacupful of wheat flour, half a teaspoonful of salt, two or three tablespoonfuls—according to taste—of molasses, and a piece of butter the size of a walnut, add one and one-half pints of lukewarm water, or water and milk mixed, in which a yeast cake has been dissolved, and mix all thoroughly together. Set in a moderately warm place, free from draught, to rise. When well risen, add one tablespoonful of wheat flour, knead well, place in pans, and set to rise. When well risen, bake in a moderately quick oven. About forty-five minutes will be sufficient to bake.

If mixed overnight, use half a cake of yeast.

HARD BISCUIT.—Weigh out four pounds of flour, and rub three pounds and a half of it with four ounces of butter, four beaten eggs, and a couple of teaspoonfuls of salt. Moisten it with milk, pound it out thin with a rolling-pin, sprinkle a little of the reserved flour over it lightly, roll it up and pound it out again, sprinkle on more of the flour—this operation continue to repeat till you get in all the reserved flour; then roll it out thin, cut it into cakes with a tumbler, lay them on flat buttered tins, cover them with a damp cloth to prevent their drying. Bake them in a quick oven.

BUNS.—Dissolve one cake of compressed yeast in a pint of lukewarm milk, or milk and water mixed. Mix together four ounces of sugar, four ounces of butter—melted—two beaten eggs, and a little nutmeg or any other flavoring to taste. Pour into this mixture the liquid containing the dissolved yeast, and add sufficient flour to make soft dough. Flour your baking board, turn the dough onto it, and spread it into a flat cake with the knuckles. Fold the dough over so that the edges meet, and press the edges together first, in order that air may be retained in the middle. Then press the dough out as before; fold it over again; press the edges together, and repeat the operation four or five times. Set the dough in a moderately warm place, free from draught, to rise, for about two hours or two hours and a half. When light, knead slightly; make into round balls, flatten them with the palm of the hand, and set them to rise again. When light, bake in a moderate oven for from fifteen to twenty minutes.

CRACKERS.—Rub six ounces of butter with

two pounds of flour—dissolve a couple of teaspoonfuls of saleratus in a wine-glass of milk, and strain it on to the flour—add a teaspoonful of salt, and milk enough to enable you to roll it out. Beat with a rolling-pin for half an hour, pounding it out thin—cut into cakes with a tumbler—bake them about fifteen minutes, then take them from the oven. When the rest of your things are baked sufficiently, take them out, set in the crackers, and let them remain till baked hard and crispy.

Cream Cakes.—Mix half a pint of thick cream with the same quantity of milk, four eggs, and flour to render them just stiff enough to drop on buttered tins. They should be dropped by the large spoonful several inches apart, and baked in a quick oven.

Crumpets.—Take three teacupfuls of raised dough; work into it with the hand half a teacupful of melted butter, three eggs, and milk to render it a thick batter. Turn it into a buttered bake-pan, let it remain fifteen minutes, then put on a bake-pan heated so as to scorch flour. It will bake in half an hour.

Rice Cakes.—Mix a pint of rice boiled soft with a pint of milk, a teaspoonful of salt, and three eggs beaten to a froth. Stir in rice or wheat flour till of the right consistency to fry. If you like them baked, add two more eggs, and enough more flour to make them stiff enough to roll out, and cut them into cakes.

Buckwheat Cakes.—Mix a quart of buckwheat flour with a pint of lukewarm milk (water will do, but is not as good), and a teacup of yeast; set it in a warm place to rise. When light (which will be in the course of eight or ten hours if family yeast is used; if brewer's yeast is used they will rise much quicker), add a teaspoonful of salt—if sour, the same quantity of saleratus, dissolved in a little milk and strained. If they are too thick, thin them with cold milk or water. Fry them in just fat enough to prevent their sticking to the frying-pan.

Green-Corn Cake.—Mix a pint of grated green corn with three tablespoonfuls of milk, a teacupful of flour, half a teacupful of melted butter, one egg, a teaspoonful of salt, and half a teaspoonful of pepper. Drop this mixture into hot butter by the spoonful, let the cakes fry eight or ten minutes. These cakes are nice served up with meat for dinner.

Indian-Corn Cake.—Stir into a quart of soul milk or buttermilk a couple of teaspoonfuls of saleratus, a little salt, and sifted Indian meal to render it a thick batter—a little cream improves the cake—bake it in deep cake-pans about an hour. When sour milk can not be procured, boil sweet milk, and turn it on to the Indian meal; when cool, put in three beaten eggs to a quart of the meal, add salt to the taste.

Indian Slapjacks.—Scald a quart of Indian meal, when lukewarm turn, stir in half a pint of flour, half a teacupful of yeast, and a little salt. When light, fry them in just fat enough to prevent their sticking to the frying-pan. Another method of making them, which is very nice, is to turn boiling milk or water on to the Indian meal, in the proportion of a quart of the former to a pint of the latter, stir in three tablespoonfuls of flour, three eggs well beaten, and a couple of teaspoonfuls of salt.

Johnny-cakes.—Scald a quart of sifted Indian meal with sufficient water to make it a very thick batter; stir in two or three teaspoonfuls of salt, mold it with the hand into small cakes. In order to mold them up it will be necessary to rub a good deal of flour on the hands, to prevent their sticking. Fry them in nearly fat enough to cover them. When brown on the under side they should be turned. It takes about twenty minutes to cook them. When cooked, split and butter them. Another way of making them, which is nice, is to scald the Indian meal, and put in saleratus, dissolved in milk, and salt in the proportion of a teaspoonful of each to a quart of meal. Add two or three tablespoonfuls of wheat flour and drop the batter by the large spoonful into a frying-pan. The batter should be of a very thick consistency, and there should be just fat enough in the frying-pan to prevent the cakes sticking to it.

Hoe Cake.—Scald a quart of Indian meal with just water enough to make a thick batter; stir in a couple of teaspoonfuls of salt, and two tablespoonfuls of butter; turn it into a buttered bake-pan, and bake it half an hour.

Muffins.—Mix a quart of wheat flour smoothly with a pint and a half of lukewarm milk, half a teacupful of yeast, a couple of beaten eggs, a heaping teaspoonful of salt, and a couple of tablespoonfuls of lukewarm melted butter; set the batter in a warm place to rise; when light, butter your muffin cups, turn in the mixture, and bake the muffins till a light brown.

Raised Flour Waffles.—Stir into a

quart of flour sufficient lukewarm milk to make a thick batter—the milk should be stirred in gradually, so as to have it free from lumps—put in a tablespoonful of melted butter, a couple of beaten eggs, a teaspoonful of salt, and half a teacupful of yeast; when risen, fill your waffle-irons with the batter, bake them on a hot bed of coals. When they have been on the fire between two and three minutes, turn the waffle-irons over; when brown on both sides, they are sufficiently baked. The waffle-irons should be well greased with lard, and very hot, before each one is put in. The waffles should be buttered as soon as cooked. Serve them up with powdered white sugar and cinnamon.

QUICK WAFFLES.—Mix flour and cold milk together, to make a thick batter. To a quart of the flour put six beaten eggs, a tablespoonful of melted butter, and a teaspoonful of salt. Some cooks add a quarter of a pound of sugar and half a nutmeg. Bake them immediately.

RICE WAFFLES.—Take a teacupful and a half of boiled rice, warm it with a pint of milk, mix it smooth, then take it from the fire, stir in a pint of cold milk and a teaspoonful of salt. Beat four eggs, and stir them in, together with sufficient flour to make a thick batter.

RICE WAFERS.—Melt a quarter of a pound of butter, and mix it with a pound of rice flour, a teaspoonful of salt, and a wineglass of wine. Beat four eggs, and stir in, together with just cold milk enough to enable you to roll them out easily. They should be rolled out as thin as possible, cut with a wineglass into cakes, and baked in a moderate oven, on buttered flat tins.

Three of the last recipes given call for the use of brewer's yeast, a substance that is now but little used. These recipes, involving the use of brewer's yeast, are published more as curiosities than for serious consideration.

Use the best flour—it is the cheapest. Always sift your flour, and in cold weather warm it slightly.

Sponges should be thoroughly mixed.

Use as little flour as possible in kneading; knead dough until it is as elastic as rubber; do not stop while kneading—dough that has rested will not make good bread.

Make small loaves and bake well.

If your bread is not light and spongy enough, give your sponge more age; if too much so, take sponge younger.

Cold and salt check fermentation, and heat hastens it; therefore your sponge may be governed by temperature and salt.

Keep dough well covered to prevent air from forming a crust; paper is better than cloth, as air will not penetrate it.

Bread is proved sufficiently for the oven when the dent produced by pressing the finger on the loaf will remain.

THE HOUSEHOLD CHEMIST

IN ADDITION to the many toilet articles for which formulas were furnished in a preceding chapter, there are many other chemical articles of daily use in the household that can be made very easily at home, with the added advantages that they are much cheaper and that *the housekeeper knows exactly what she is using.*

No apparatus is needed in this work other than that which was called for in the chapter on "Best Cosmetics." One article of daily use is a flavoring extract of one kind or another in the routine of cookery. We give below formulas for making the three extracts most commonly employed:

EXTRACT OF VANILLA

Vanillin	Thirty grains
Alcohol	Twelve ounces
Water	Ten ounces
Caramel	Twelve drams
Syrup	Four drams

Vanillin is a synthetic form of vanilla, extracted from many different kinds of woods. In chemical composition it is identical with the vanillin extracted from the costly vanilla bean, and is in every way as healthy. The synthetic product is really to be preferred to that taken from the bean, as it is more uniform in strength. Dissolve the vanilla in the alcohol. When thoroughly dissolved add the water and shake well. The syrup and the caramel are next added in turn, each with considerable shaking, to ensure thorough admixture.

Make the caramel by placing a pound and a quarter of granulated sugar in a clean agate pan. Place this on a stove where the fire is not too hot, and stir the sugar while it gradually turns from white to a rich dark-brown. At the same time the sugar will liquefy. Pains must be taken to prevent it from scorching. When

the boiling-point is reached, remove the melted sugar quickly from the stove. Now, with vigorous stirring add just enough boiling water to make a pint of liquid in all, taking pains that the burned sugar is all dissolved. Strain through cloth and bottle as soon as cool enough. Caramel is also much used for darkening soups.

EXTRACT OF ORANGE

How much orange peel is thrown away in every household? More than enough every year, certainly, to supply a dozen similar families with all the extract of orange required.

Take the peels of two or three oranges while still fresh and moist. With a knife scrape away all the white inner part of the peel, leaving only the outer golden part. Cut this outer peel into very tiny pieces. Weigh out two ounces of this cut peel and put in a bottle. Over the peel pour eight ounces of alcohol. Stopper the bottle tightly, shake a few times, and set away for a week, shaking the bottle vigorously several times each day. At the end of the week—or, better still, two weeks—filter the liquid through filter paper. The filtrate will be extract of orange, and the housekeeper will know that she has an article free from any kind of injurious adulteration.

EXTRACT OF LEMON

is made in exactly the same way, substituting the same part of the lemon peel for orange peel.

CAUTION.—Never use the same piece of filter paper for extracts of two different flavors. After filtering always cleanse the glass funnel thoroughly with hot water and soap. Otherwise there will be a confusion of flavors.

All flavoring extracts are better for standing for some length of time before using. An extract that has stood for a year is better than one that has stood for six months. For the same reason, in the cases of lemon and orange extracts, it will be better if the housekeeper can let the alcohol stand for several weeks before filtering. If a little is required for immediate use, filter off what is needed. Let the rest remain in the mixing bottle.

All of the above extracts can be made profitably for sale, and the manufacturer, if the above formulas are faithfully followed, can guarantee the absolute purity of the goods. Let no reader, however, make the grievous error that one of the writer's correspondents once made. She used *wood alcohol because it was cheaper than good alcohol!* Wood alcohol is a rank poison, utterly dangerous to the stomach. In making extracts use only the best 95 per cent alcohol.

SILVER POLISHING POWDER

Whiting..... Seven pounds
Oxide of iron..... One pound

Whiting is an excellent cleanser and polisher of silver. It is the basis of 99 per cent of the silver polishing compounds in the market, and several pounds may be bought for five cents. Some housekeepers object that whiting *scratches* silver. This is because it has not been freed of grit. Oxide of iron is the commercial form of jewelers' rouge, but is very much cheaper. After mixing the two powders according to the above formula, pass the mixture several times through a very finely meshed patent flour-sifter. This will remove the grit. When polishing silver, moisten a soft rag and take up a little of the powder. Rub well and briskly all over the silver until the piece is clean. Then rinse with warm water, dry and polish with a clean, soft piece of canton flannel. The results will equal those accomplished with any silver polish in the market.

PUTZ POMADE (PASTE POLISH FOR BASER METALS)

It is not profitable to make this compound in smaller quantity than is called for in this formula:

Oxalic acid.....One pound
Oxide of iron..Twenty-five pounds
Rottenstone.....Twenty pounds
Palm oil.....Forty pounds
Vaseline.....Four pounds

The first three ingredients may be obtained at any paint shop. The oils should be secured of some wholesale oil house. A very poor grade of vaseline will answer. As oxalic acid is a violent poison, it is better to buy only what is needed for immediate use. Grind it to a fairly fine powder and mix thoroughly with the oxide and rottenstone. When this is done, place the oil and vaseline over the fire, melting and stirring them together, and taking pains not to scorch the vaseline. When the oil and vaseline are melted add the powders, stirring until the mixture is complete. Remove from the fire and stir until the paste is cold and firm.

LIQUID PUTZ POLISH

Many housekeepers prefer to use a liquid polish for metals. Stir from twelve to fifteen ounces of the above paste in a gallon of benzine, and, when well stirred, add ammonia water, a tablespoonful at a time, until the liquid becomes thick and creamy. This preparation will have to be shaken always before using.

LEMON JUICE

Lemon juice as excellent and healthful as that which comes from lemons may be made in this way:

Water.....Three pints
Citric acid.....Four ounces
Essential oil of lemon peel.. Eight drops
Extract of lemon.....One-half ounce

Pour the water into a two-quart bottle. Add the citric acid and shake until completely dissolved. Then pour the eight drops of essential oil of lemon into the lemon extract, stir well, and add to the contents of the bottle. Shake well, and the lemon juice is ready for use. It should be kept in a cool place, but will last indefinitely.

It is wise to keep this preparation in glass only. It should never be poured into an earthen jug that has a brown glazed inside, for this glaze is supplied by the use of lead. The citric acid, acting upon the brown glaze, would produce citrate of lead, a very dangerous poison.

There is much prejudice in the minds of misinformed people against lemon beverages made from citric acid. Yet this acid is merely the crystal formed by the evaporation of the juice of lemons or limes, and is made in countries where lemons and limes are much cheaper than here. True, there are some bad preparations made of citric acid and more dangerous substances, but no one need fear to use the lemon juice described above. A tablespoonful or more to a glass of water may be used, according to taste.

BLACK INK

The best article procurable in this line may be made without trouble and at trifling expense by dissolving an ounce of nigrosin in three pints of boiling water, stirring the same until all the nigrosin is dissolved. Nigrosin is a form of aniline black soluble in water, and costs from twenty-five to thirty cents per ounce package. This ink is ready for bottling as soon as it is cold, although it is better, where convenient, to let it stand exposed in a shallow pan for some days in a room where there is no dust. This exposure to the air quickens the blackening of the ink, though the same result is achieved, more slowly, by allowing it to stand in bottles for some weeks. If kept tightly stoppered it can not mould. This ink, simply as it is made, is permanent and fine enough for bank and counting-room work. It flows freely, and is an ideal ink for fountain pens.

INDELIBLE BLACK INK

Aniline black...Thirty-two grains
Alcohol.....One pint
Glycerine.....One pound (about 12 fl. oz.)

In this formula nigrosin must not be used, as in the preceding one. What is called for here is the regular aniline black, not soluble in water, but soluble in alcohol. Dissolve the aniline black in the alcohol by vigorous shaking in a bottle. Next pour in the glycerine, a little at a time, shaking well after each addition until the mixture is complete. This indelible ink is used for marking linen in the usual way, passing a hot iron over the writing as soon as it is dry.

DEXTRINE MUCILAGE

Dextrine is a form of starch that has been through processes not necessary to explain here. In its properties it is very much like gum arabic, and it costs but a few cents a pound. To any ordinary quantity of boiling water over a fire add dextrine, a little at a time, with much stirring, until the water has dissolved as much of the dextrine as it can. When this is done, strain the mucilage through a fine cloth. When cool, add oil of cloves, with more stirring, at the rate of twenty drops, or a little more, to every quart of mucilage. The clove oil is used to keep the mucilage from souring. The dextrine left on the straining cloth may be used over again.

GUM ARABIC MUCILAGE

Dissolve four ounces of gum arabic in a pint of boiling water. It may be made thinner if desired, but will then, of course, lose in adhesiveness. Use the same proportion of oil of cloves as in the preceding formula.

STOVE POLISH

Black lead.....One pound
Copperas.....Two pounds
Bone black.....One pound

As the copperas comes in crystals it must be ground to a fine powder. The three ingredients are then well mixed. For use add enough water to a little of the powder to make the liquid of about the consistency of cream. Apply to the stove in the usual way and brush briskly. A lustrous and durable polish is obtained. There is no better article on the market.

A TEST FOR SEWER GAS

Dissolve one ounce of acetate of lead ("sugar of lead") in six ounces of water. When solution is complete pour into a shallow glass dish. Immerse in this liquid strips of paper two inches long and a half inch wide. The paper should be white, and rather porous; glazed paper will not do. When the strips have been thoroughly soaked in the solution pin them on a standing board to dry. When dry place several strips in a vial and stopper it tightly. When it is desired to ascertain whether sewer gas is present in a room lay one of these strips in a dry saucer. If sewer gas is present the paper will soon begin to turn dark. If the paper remains white after two or three hours it is a sure sign that sewer gas does not lurk in that apartment. Remember always, in handling the solution of acetate of lead, that this substance is a deadly poison.

AN EASY WAY TO CLEAN EGG-SPOONS

Here is a little chemical trick well worth knowing. When silver spoons become tarnished from use in boiled eggs, scour the tarnished parts with a little moist salt. The tarnish will disappear as if by magic.

OTTAR OF ROSES

Although one of the most expensive perfumes, and generally considered a luxury beyond reach of the many, this exquisite article can be cheaply produced by a person possessing an abundance of rose trees. The following plan must be pursued: Take rose leaves sufficient to fill a two-gallon jar when pressed tightly down and let them be fresh when placed in the jar. Secure a flat two-ounce vial to take the place of a stopper. It must close the jar up tightly and should be filled with strips of sponge steeped in pure odorless olive oil. Let the vial be placed with the mouth downward and the jar be stood in the sun for at least a week. More rose leaves should be added as space is available in the jar. The rose leaves will be distilled by the sun while the aroma rising into the sponge will be absorbed by the oil. A little vial of the genuine ottar of roses will be the result. As this substance is volatile the bottle must be tightly corked.

TO DISTIL PERFUMES

Take any flowers desired and place in alternate layers with common salt in a clean glazed earthen pot. Fill quite up, cover well, and place the pot in a dark cellar. Forty days afterward place some gauze over a pan and strain the juice out of the flowers over it by pressure. Bottle the essence and expose for several weeks in the sun and dew of the evening to purify. One drop of the essence will scent a quart of water.

THE POT-POURRI JAR

First gather your rose leaves early in the morning and leave them in a cool airy place until the dew has evaporated. Next place them in a large glass jar, sprinkling salt over half-inch layers of the leaves. Continue adding to the contents of the jar until it is filled. For ten days, then, let them stand, stirring the whole thoroughly every day. Take one ounce each of cloves and allspice, coarsely ground, and the same quantity of stick cinnamon, finely shredded. Transfer to another jar and scatter the spices, well mixed together in layers, between the leaves. Cover the jar tightly and let it stand in a dark place for three or four weeks. Then the pourri is ready for its permanent jar, which must have a double cover.

Now take a quarter ounce of mace and half an ounce each of allspice and cloves, all coarsely ground or pounded in a mortar, half a grated nutmeg, half an ounce of cinnamon, broken in bits, one ounce of powdered orris root, and quarter of a pound of dried lavender flowers. Mix all these together in a bowl and as the stock is transferred to the permanent jar place the spice mixture between it in layers. As the jar is filled scatter on the successive layers a few drops each of the essential oils of rose, geranium, bitter almond, and orange flower. Then pour over all an ounce of the favorite toilet water or colonge. You will have sufficient to fill a two-quart jar and the contents will keep for years. From time to time add various sweet things, such as a tuberose, a bunch of violets, or a spray of heliotrope. Open the jar for half an hour

daily and the atmosphere of the house will be permeated with a delightful, spicy fragrance such as might be imagined to come from an enchanted Arabian garden.

COLOGNE WATER

To make this toilet necessity take a quart of pure alcohol and add to it sixty drops each of orange flower water, oil of bergamot, oil of lemon, and oil of lavender. Cork tightly, shake thoroughly, and allow it to stand for several weeks before opening the bottle. It will excel the imported article.

DRESS PROTECTORS

Blotting paper incased in gauze is an excellent and harmless substitute for the oil skin or gutta-percha article. The latter stop the healthy action of the sebaceous glands and the blotting paper absorbs the perspiration, leaving the pores free to perform their proper functions.

INTERESTING FACTS AND USEFUL RECIPES

ABSCESS, TO TREAT.—Bring it to a head by a flaxseed or bread-and-milk poultice, or by a hot-water compress; then, having opened and emptied it, wash out the cavity by injecting a mixture of one part carbolic acid and twenty of warm water.

ACID STAINS, TO REMOVE.—Use spirits of hartshorn, diluted, repeating if necessary.

ACID STOMACH, TO CORRECT.—Put a teaspoonful of powdered magnesia in half a glass of water, and take a teaspoonful three times a day.

AGUE, CURE FOR.—Slice three lemons into thin pieces and pound them fine; then make a quart of coffee, and having boiled it down to a pint, pour it, while still hot, over the lemons. When the mixture is cold, strain it through a cloth and drink the whole at one dose before the chill passes off and there is a renewal of the fever.

ANTS, TO DESTROY.—Among the various ways of ridding a room or closet of ants are the following: (1) Grease a plate with lard and place against the plate a stick or broom wisp for the insects to climb up on. As soon as a number have been caught, hold the plate over a coal fire and the ants will drop off. The trap may then be reset. (2) Place camphor in a closet infested by them, or bits of sponge or rag kept moistened with creosote. (3) For black ants, put fresh bones in places where they congregate. They will collect on the bones and these should then be scalded.

APERIENTS.—(1) "Black Draught," a mixture too strong for children to take, is made as follows: To 6 drams senna leaves, ½ dram bruised ginger, 4 drams sliced liquorice root, add ½ pint boiling water. After the mixture has stood near the fire for three hours, strain it and add 1½ drams sal volatile and ½ ounce each of tincture of senna and tincture of cardamoms. Keep in a cool place. The dose for an adult is a wineglassful; for youth above 15 years of age, 2 tablespoonfuls. (2) SPRING APERIENT.—Mix 1½ drams tartrate of soda, 15 grains each of powdered galap and powdered rhubarb, 2 grains of ginger. Dose for an adult, 3 teaspoonfuls, or the whole quantity if the patient is otherwise in good health; for a youth above 15, hali the whole quantity, or 2 teaspoonfuls; for children between 10 and 15, a large teaspoonful; for children under 10, a small teaspoonful. The powder may be dissolved in warm water or in tea. (3) The old-fashioned, simple aperient for children, made by mixing brimstone and molasses and adding to each teacupful a teaspoonful of cream of tartar, is excellent, but in many cases it produces nausea.

BAD BREATH.—There is no permanent cure for this affliction, but a general toning up of the system will tend to alleviate it, as well as strict attention to keeping the teeth clean. It may be temporarily relieved by using a gargle made by diluting a little bromo-chloralum with 8 or 10 parts of water. A few drops should be swallowed as well.

BALDNESS, TREATMENT FOR.—(1) Take of eau de cologne 2 ounces, tincture of cantharides 2 drams, oil of lavender or rosemary 10 drops. Mix well and wash the head once or twice a day.

BATHTUBS, TO CLEAN.—The dirt collected around the sides of porcelain bathtubs may be removed with kerosene. Apply with a cloth saturated with the oil; rinse out, and rub with hot water and soda. The white

blotches that form on zinc-lined tubs may be removed in the same manner.

BEDBUGS.—(1) Make a creamy paste of 2 ounces of red arsenic, ¼ pound white soap, and ½ ounce camphor, dissolved in a teaspoonful of spirits rectified. Put this paste into the openings and cracks of the furniture and of picture-frames and mirrors. (2) Remove all clothing from the room, stop the cracks in the windows, and then fumigate the room and bedding, if there is any, with brimstone or a sulphur candle. The latter should be placed in a deep tin pail or vessel to prevent it from setting fire to anything. Let the room remain closed for 24 hours.

BED SORES, TO PREVENT.—Change the position of the invalid as often as possible and keep the under sheet smooth and dry. If the skin is not broken, sponge the parts that touch the bed with alcohol or whisky and water, applying it three or four times a day.

BEE STINGS, CURE FOR.—Put a pinch of salt on the place, dissolve it with water and rub it briskly. If this fails to relieve, wet the place with aqua-ammonia, being careful if the sting is on the eyelid not to get the ammonia in the eye. Soda and saleratus are good substitutes, spirits of hartshorn applied with a soft rag is a capital remedy, and fresh wood ashes moistened with water and made into a poultice frequently renewed is another.

BLACK CLOTHES, TO RESTORE.—Having boiled three ounces of logwood in a quart of vinegar until the color has been extracted, put in a piece of carbonate of iron the size of a large chestnut. Let it boil five minutes. After you have sponged the article of clothing with hot water and soap, sponge it with the dye. It now remains to set the color, for which a third sponging is necessary—this time, and while the article is thoroughly wet, with a teacupful of warm water in which a teaspoonful of saleratus has been dissolved. Do not wring or wrinkle the article before hanging it up to drain.

BLOOD-STAINS, TO REMOVE.—Mix starch as if for laundry use, and lay a thick coating of it, wet, on the stain. If this does not answer, steep the article in a solution of iodide of potassium in four times its weight of water.

BOTTLES, TO CLEAN.—Put powdered charcoal with hot or cold water into the bottles and shake thoroughly, then allow the water to stand a little while.

BRASS OR COPPER, TO CLEAN.—Powder some rottenstone very fine and sift it, and then add oil of turpentine and soft soap, mixing the whole until it is like putty. Having removed every trace of grease from the article, with warm water, mix a little of the compound with water and rub it over the metal, then repeat the rubbing, using a dry rag or piece of leather. The metal will be polished as well as cleaned.

BRONCHITIS.—Relief is sometimes obtained by holding a small quantity of saltpetre, say a cent's worth, in the mouth and swallowing it as it dissolves. Often the attack may be cut short by giving a hot mustard foot bath, with 10 grains of Dover's powder, or a hot lemonade at bedtime.

BURNS.—Common wheat flour sprinkled thickly on a burn will prevent blistering and scarring, and baking soda is similarly efficacious. A mixture of sweet oil and lime water will relieve the pain. If the burns have been produced by powder, wrap the hand or finger in a cloth saturated with 1 per cent solution of carbolic acid. Keep the cloth wet for two days.

CARPETS, TO CLEAN.—(1) Sprinkle with moist tea leaves; then sweep thoroughly, using soft-soap and warm water on the grease and dirt spots. (2) A teaspoonful of ammonia in a gallon of water will restore the color; or, after the carpet has been well beaten, scrub it with ox-gall; 1 pint to 3 gallons of water for a large carpet.

CEMENT FOR CHINA.—Dissolve gum arabic in water until you have a very thick solution. Stir in plaster of Paris until the mixture becomes a sticky paste. Apply with a brush to the fractured edges and stick them together. A paste of white of egg and flour answers well for small articles, but vases mended in this way will not hold together if water is put in them.

CEMENT FOR EARTHENWARE.—Grate a pound of cheese into a quart of milk; let it stand 14 hours, stirring frequently. Pulverize a pound of unslaked lime in a mortar and add. Mix by beating; then beat in the whites of 25 eggs.

CHAPPED HANDS AND LIPS, TO CURE.—(1) Take the yolk of one egg, 2 oz. honey, 1 oz. oil almonds, a little scent of some kind and ½ oz. powdered orris root. Use as little of the mixture as possible at one time. (2) Heat together, until dissolved, ¾ oz. powdered gum camphor, 4 teaspoonfuls oil of sweet almonds, 1½ oz. spermaceti. Stir constantly and when cool use freely on hands and lips.

CLOTH, TO BLEACH.—Add the strained juice of one lemon to a quart of cold water; spread the cloth on the grass in the sun and wet it several times a day. It may take a long time to whiten the cloth perfectly.

COCKROACHES, TO DRIVE AWAY.—(1) Mix a teaspoonful of powdered arsenic with a tablespoonful of mashed potato and sprinkle wherever the insects congregate. (2) Sprinkle powdered borax thickly in every place infested. (3) Cut up green cucumbers and put them at night in places infested. Fresh pieces should be used for several nights running.

CORNS, TREATMENT OF.—Either hard or soft corns may be removed by applying night and morning with a soft brush the strongest acetic acid (vinegar), or by applying every night a poultice of bread wet with cider vinegar.

COTTONS, TO WASH.—A teaspoonful of black pepper stirred into the first suds in which cottons are washed will prevent the colors from running. A handful of salt in a pailful of water makes a solution which fixes colors, but does not prevent their fading. Many use salt in preference to sugar of lead for pinks, blues, and lavenders. Five cents' worth of sugar of lead crystals dissolved in a pailful of water makes a solution which will establish the tone. The fabric should remain in the salt or sugar of lead bath a half hour or so before going to the suds. The garment should not be hung in the sun to dry. Alum water is a sure fixative, but it sets grime as well as hue.

CRACKS IN IRON STOVES OR STOVEPIPES.—To mend these, make a paste of wood ashes and common salt and apply, whether the iron or pipe be hot or cold.

DANDRUFF.—See HAIR WASH.

CURTAINS, LACE, TO CLEAN.—Pin a sheet to the carpet so it will lie without a wrinkle; then scatter over it dry Indian meal and powdered borax mixed in the proportion of one cupful of meal to one teaspoonful of borax. Pin a curtain tightly over the sheet and cover this with the mixture; on this place another curtain and a layer of the mixture until all the curtains have been used. Pull out the pins, roll the curtains tightly so they will be covered by the sheet; lay the roll aside for two or three weeks and then shake the curtains free of the mixture.

DISINFECTANTS.—An unpleasant odor in a room may be removed by hanging up a cloth saturated with a weak solution of carbolic acid. (2) Heat an iron shovel hot and pour vinegar upon it. The doors and windows of the room should be open at the time. (3) Roast coffee until it is of a dark brown color, pulverize it, and burn it on a shovel, or sprinkle it about the room. (4) Take ½ cupful of common salt and 2 or 3 oz. sulphuric acid. Pour upon the salt ½ oz. of the acid and stir every 15 minutes till all the acid is used. The mixture should then be sprinkled about. To disinfect a sink or other place needing thorough cleansing, put ½ lb. of copperas in 2 qts. boiling water, and, when the copperas is thoroughly dissolved, flush the pipes with the solution.

EARACHE, CURE FOR.—(1) Put a pinch of black pepper in a bit of cotton wool wet in sweet oil and insert it in the ear. (2) Put live coals in a pan, sprinkle them with brown sugar, invert a funnel over the coals and put the tube in the ear, which will soon feel the soothing effect of the fumes.

EYELIDS, INFLAMED.—Mix in a glass mortar one scruple of prepared calomel and ½ oz. spermaceti ointment. Apply a small quantity to each corner of the eye night and morning, and also to the edges of the lids. The bowels should be kept in a laxative state as long as this preparation is used.

FEATHERS, TO WASH AND CURL.—Wash the feathers in warm soap suds and (if they are white) rinse in water slightly blued, then dry in the wind. To recurl, which should be done over a hot flatiron, use a bone or silver knife, drawing the fibres of the feather between the thumb and the dull edge, three fibres at a time. Begin at the point of the feather and curl one-half the other way.

FLIES, TO KILL.—Boil quassia chips in water, sweeten with syrup of some kind, and pour the liquid into plates. A room may be kept free from flies by pouring a little alcohol into saucers and adding to each a teaspoonful of oil of lavender. A piece of clean sponge should be placed in the saucer.

FOOT WASH (For Tired Feet).—Dissolve a pint of sea salt in 2 qts. water; pour into a covered jar or bottle and let it stand 24 hours. Pour 1 qt. brine into 1 qt. of hot or cold water and bathe. As the brine is used the bottle may be filled with clear water, repeating the process till all the salt is gone.

FRAMES, GILT, TO CLEAN.—Having dusted the frames, rub on gently with a camel's hair brush, the white of an egg. This will

remove all kinds of dirt. Still better is a mixture of white of egg, 2 oz.; chloride of potash or soda, 1 oz.

FROST-BITES, TREATMENT OF.—Rub the parts affected with pure oil (not essence) of peppermint. This will also prevent the after effect of chilblains.

FROZEN LIMBS, CURE FOR.—Dissolve from ¼ to ½ lb. of alum in a gallon of warm water and immerse the feet or hands in it for ten or fifteen minutes.

FURNITURE, TO CLEAN AND POLISH.—(1) Mix 3 parts linseed oil with 1 of turpentine, and apply with a woolen rag. This will not only clean but also give a fine lustre. (2) Mix (and shake well) cold linseed oil, 1 qt.; gin or spirits of wine, ½ pint; vinegar, ½ pint; butter of antimony, 2 oz.; spirits of turpentine, ½ pint. It must be applied to the surface with a rubber, and if the furniture is new several applications will be necessary.

FURNITURE VARNISH FOR UNPAINTED WOOD.—Sandpaper the wood thoroughly and lay on a very thin coat of varnish with a piece of sponge or wadding covered with linen. When dry, rub down with pumice dust and apply a second coat of varnish. Three or four coats may be necessary.

FURS, TO RESTORE.—Sprinkle them with hot flour and sand and brush thoroughly with a hard brush; then beat with a stick or cane, comb with a wet comb and press carefully with a warm iron. If the fur is ermine, substitute plaster of Paris for the flour and sand.

GLASS, TO PREVENT CRACKING OF.—Put your chimneys, tumblers, or other articles in a pot filled with cold water and a little cooking salt; let the mixture boil well and then cool slowly.

GLOVES, TO CLEAN.—(1) Wash the gloves when on your hands in spirits of turpentine and dry them before removing. (2) Pour 1 teacupful of benzine into a pint bowl and put a pair of gloves into it, soaking them and rubbing them together as though they were cotton rags; then rinse in fresh, clean benzine; squeeze them as dry as possible, beat them against each other and hang them in the air for an hour or so. Care should be taken not to do the cleaning near a gas jet or candle flame.

GREASE-SPOTS, TO REMOVE.—(1) Cover the spots with buckwheat flour, magnesia, French chalk, or potter's clay; over this put a piece of brown paper; set a moderately warm iron on this and let it remain till it gets cold. The iron must not be so hot as to scorch or change the color. If the article is of woolen, apply fuller's earth; if the grease is wax or tallow, warm carefully with an iron; then apply the fuller's earth. If the article is of silk, lay a piece of woolen cloth or baize upon a pine table and upon this the part stained, right side downward. Over this, place a piece of brown paper and for about five seconds apply a flatiron just hot enough to scorch the paper; then rub the stained part briskly with a piece of smooth writing paper.

HAIR WASH.—(1) A good wash to keep the hair from falling out and to prevent dandruff is made by taking 1 oz. powdered borax, 1 oz. powdered camphor, and mixing them with 1 qt. boiling water. When cool, pour into a bottle and apply it to the head, once a week, with a flannel rag or sponge. (2) Take 48 grains resorcin, ¼ oz. glycerine, and enough alcohol to finish filling a 2-oz. bottle. Mix and apply to the scalp every night, rubbing it well in.

HEADACHE.—Mild attacks may be cured by (1) water applied as hot as the skin can bear it; (2) draughts of hot water, and a warm foot bath, ashes or soda having been added to the water; (3) soaking the feet in hot water, drinking herb tea and taking a sweat. Severe attacks of a nervous kind have been relieved by giving ¼ grain of ipecac every half hour or hour, and cured by administering the ipecac in 1 to 3 grain doses three or four times daily.

HOARSENESS, REMEDIES FOR.—(1) Take green horseradish root, boil it down and sweeten it into a thick syrup. (2) Boil 2 oz. of flaxseed in 1 qt. of water; strain, add 2 oz. rock candy, ½ pint syrup or honey, and the juice of 3 lemons; mix and then boil; cool and bottle. Take a cupful, hot, before going to bed. (3) To the white of 1 egg, beaten up, add the juice of 1 lemon and sweeten with white sugar. Take a teaspoonful from time to time.

INK STAINS, TO REMOVE.—(1) Soak the stained part in strong salt water; then wash with ammonia. (2) Apply to the stain muriatic acid diluted with five or six times its weight in water, and after a few minutes wash it off. If the article is of linen, dip the ink-spot in pure melted tallow; then wash out the tallow and the ink will come out with it.

IRON-RUST STAINS.—To remove these, moisten the stained parts with a solution of oxalic acid; then lay in the sun, and when the stain is out rinse thoroughly.

The acid must not come in contact with any abraded surface of the hands or face. Another way is to moisten the parts with lemon juice, sprinkle them with salt, and then lay the article in the sun.

Ivy, or Sumach, Poisoning.—The simplest remedy for this is hot water applied as hot as the skin will bear it. A cloth should be dipped in the water and laid on the flesh. Vaseline sometimes relieves the itching, and for the same purpose one can use a weak solution of ammonia in water, applying it with moderation. Another external application consists of a teaspoonful of calomel in a pint of lime water. The following is recommended, also: Bromium dissolved in olive oil, cosmoline or glycerine in the strength of 10 to 20 drops of bromium to an ounce of oil. Rub the mixture on three or four times a day; as it is volatile, it must be renewed within twenty-four hours. Bathing the parts affected with sweet spirits of nitre three or four times a day is often efficacious.

Kid Shoes, To Soften.—Melt ¼ lb. of tallow, pour it into a jar and add the same weight of olive oil; stir and let stand till cold. Apply a small quantity occasionally with a piece of flannel. Should the shoes be very dirty, clean with warm water.

Laces, To Clean.—If your lace is black, mix a gill of rain-water, a tablespoonful of borax, and one of alcohol; squeeze the lace several times through this; then rinse in a cup of hot water in which a black kid glove has been boiled; pull the lace out carefully till nearly dry; then press 2 or 3 days between sheets of paper under a heavy weight. If the lace is white, draw a stocking leg over a bottle and fasten it at each end. On this tack the lace and put it in a kettle of cold water with shavings of white soap in it. Raise the water to the boiling point, remove and rinse. If a cream color is desired, rinse in cold coffee or saffron-water. Dry and remove from the bottle. Pick out the purling with a pin, and lay between soft papers and under a heavy weight.

Liniment, To Make.—(1) Take of linseed oil and lime water equal parts and mix. This is useful for burns and scalds and in preventing rheumatism after such accidents. (2) Dissolve gum camphor in sweet oil and rub on three times a day with flannel or woolen cloth, wrapping up the wound with the cloth after rubbing it in. This is useful for strains, sprains, and bruises in man or beast.

Looking-Glass, To Clean.—(1) Dampen a sponge with water or spirits of wine and remove every speck and stain; then dust the surface with the finest sifted whiting or powder-blue, and polish it with a silk handkerchief.

Marble, To Clean.—(1) First go over with a soft sponge and strong, cold soap suds; then wash off the soap with clear water. Having removed the dirt and grease, rub over with fine powder of calcined tin moistened with water and applied with a cushion of cotton. After rubbing with this for a short time, finish by rubbing with a piece of canton flannel or soft leather, which will restore the gloss. (2) Make a paste with soft soap and whiting. Wash the marble with it and then leave a coat of the paste upon it for two or three days. Afterward wash off with warm (not hot) water.

Matting, Straw, To Clean.—Use a cloth wet in clean salt and water to wash the matting. Wipe dry immediately.

Moths, Protection Against.—Take an ounce of gum camphor and the shell of a red pepper, macerate them and let them stand in 8 oz. of strong alcohol for a few days; then strain. Sprinkle this over articles to be preserved and roll them up in sheets.

Mumps, To Treat.—Keep the face and neck warm, and avoid taking cold. Drink warm herb teas, and if the symptoms are severe, 4 to 6 grains of Dover's powder; or if there is costiveness, a slight physic, and observe a very simple diet. If a severe cold has been taken and other glands are affected, physic must be taken, and leeches or cooling poultices applied to the swelling. Sweating must be resorted to in this case.

Nausea, To Relieve.—Beat up one egg for about twenty minutes, add 1 pint fresh milk, 1 pint water, and sugar to make it palatable; boil and cool. This makes an agreeable drink.

Neuralgic Pains, Lotion for.—Take equal parts of opodeldoc, spirits of wine, and sal ammoniac; shake and bottle. (2) Prepare horseradish by grating and mixing in vinegar, the same as for the table, and apply to the temples when the head is affected, or to the wrist when the pain is in the arm or shoulder. (3) Facial neuralgia may be relieved by applying to the gums with a linen cloth a mixture of 1 part aconite, 1 of chloroform, and 2 of alcohol or cologne water.

Nose-bleed, Treatment of.—Keep the

head raised; find which nostril the blood flows from, and on that side raise the arm perpendicularly, and hold the nose firmly with the finger and thumb. At the same time a towel wet with ice water or filled with snow should be applied to the forehead, though often it is more efficacious when placed on the back of the neck.

Oil Paintings, To Clean.—Wash the canvas or panel with soap and soft water slightly warmed. Dry the surface with a soft cloth and rub it with a warm silk handkerchief before a fire.

Paper, Wall, To Clean.—Remove the dust with a soft cloth; then make a lump of stiff dough of flour and water, and rub the wall gently downward as far as the arm will sweep. Having gone around the room, return and begin your stroke a little above where the last one ended. Do not cross the paper or rub upward.

Pewter, To Clean.—(1) Use a solution of oxalic acid; then rub with whiting and water. (2) Use a paste of fine wood ashes mixed with vinegar and salt.

Pin Holes in Lead Pipe.—To stop these up, place the head of a tenpenny nail over the hole and give the other end two or three slight blows; this will force the lead together.

Poison, Antidote for Any.—Stir a heaping teaspoonful of common salt and one of ground mustard into a glass of water and drink it all at once. When this emetic has acted, take the whites of 2 eggs instantly. For corrosive sublimate, swallow 6 raw eggs at once after the emetic. For laudanum, take a cup of clear strong coffee; for arsenic, ½ cup sweet oil or lard after the emetic.

Rat Poison.—(1) Take of flour 3 lbs.; sugar, ½ lb.; sulphur, 2 lbs.; phosphorus, 2 lbs.; mix and spread on pieces of bread. (2) Mix 1 oz. arsenic, 1 oz. lard, and mix into a paste with meal.

Rheumatism, Remedy for.—To 1 oz. of Castile soap cut into small bits or grated, add a heaping tablespoonful of red cayenne pepper. Pour on this ½ pint boiling hot water. Stir until all is dissolved and add a little cider-brandy or alcohol when bottling. After applying this to the joints, rub on a little sweet oil to relax the muscles.

Rust, To Remove From a Stove.—Scrape some bath brick to a fine powder, mix a little oil with it, and rub the spots well with a piece of flannel dipped in the mixture; after which apply some whiting and rub it well in. Several applications may be necessary before the rust disappears.

Sea Water, To Make Suitable for Washing.—Put in soda till the water becomes turbid; the magnesia and lime in it will then be precipitated.

Shirt Bosoms, To Make Glossy.—Take 2 oz. fine gum-arabic powder, pour on a pint or more water, and then, having covered it, let it stand all night. In the morning pour it carefully from the dregs into a clean bottle, cork and keep for use. Add a teaspoonful of the gum water to every pint of starch.

Shoe Soles, To Make Water-tight.—Warm a little beeswax and mutton suet until in a liquid state and apply over the stitches.

Silk, To Clean.—Take equal quantities of alcohol (whiskey will do), soft soap made of wood ashes and molasses. Mix and rub on with a cloth; afterward rinse in clear water once or twice and dry it or wrap in a cloth till ready to iron.

Silver, To Give Lustre To.—Make a strong brine of alum dissolved in water; skim carefully, then add soap. Apply with a linen rag, rubbing gently.

Soap, Hard.—To 5 pails soft soap add 2 lbs. salt and 1 lb. resin. Simmer together and when thoroughly fused turn out in shallow pans so as to be easily cut.

Soap, Soft.—Boil 25 lbs. fried grease in 2 pails of strong lye. On the following day another pailful of hot lye; also on the next day if there is grease on the top of the soap. Afterward add a pailful of hot water each day until the barrel is filled.

Stains on the Hands.—Dissolve five cents' worth of crystals of oxalic or citric acid in a 6 oz. bottle of water. Rinse from the hands before they are dried. This should be labeled "Poison" and put where no child can get at it. A few drops of oil vitriol (sulphuric acid) in water is excellent for fruit or dye stains, but it must be used with great care, as it eats holes in cotton fabrics and takes the color out of woolens.

Stoves, To Give Lustre To.—Mix a teaspoonful of lye with the polish. This will give a permanent lustre. Polish may be made to stay on by adding to it a little vinegar or a pinch of granulated sugar.

Summer Suits, To Wash.—The water should be tepid and the soap should not be applied directly to the fabric. The articles

should be washed and rinsed quickly and turned; than hung in the shade. When starched in thin starch, they should be folded in a delicate white cloth; then ironed on the wrong side quickly. It is well to wash in water in which hay or a bag of bran has been boiled. A little salt will set the colors of light cambrics and lawns; a little oxgall is good for yellow and purple tints.

Sunstroke, Treatment Of.—While waiting for the physician, give the afflicted person cool drinks of water, or cold black tea or cold coffee, if able to swallow. If the skin is hot and dry it should be sponged with cold water, or cold water should be poured over the body and limbs, and powdered ice should be applied to the head, wrapped in a towel or cloth. If no ice is procurable, use cloths wet in as cold water as possible. If the person is faint and the pulse is feeble, inhaling ammonia, or drinking a teaspoonful of aromatic spirits of ammonia in 2 tablespoonfuls of water with a little sugar, will be restorative.

Tan and Sunburn, To Prevent.—Before going into the open air, rub the juice of a fresh lemon over the face, letting it dry. At night, dust a little oatmeal over the face; in the morning wash it off and rub on a little cold cream or buttermilk.

Teeth, Dentifrice For.—Dissolve 2 oz. borax in 3 pints warm water; before this becomes cold add 1 teaspoonful of tincture of myrrh and 1 tablespoonful of spirits of camphor; then bottle. Use a wineglassful at a time in a pint of tepid water. A little lemon juice occasionally squeezed into the tooth-brush will remove tartar.

Tinware, To Mend.—Fill a vial two-thirds full of muriatic acid, put in little bits of zinc, as long as the acid will act; add a bit of sal-ammoniac, and fill with water. With the cork of the bottle dampen the spot to be mended, then apply a bit of sheet zinc over the hole and apply a lighted candle under the place; wet the zinc with the solution, or a little solder may be used instead of the zinc.

Toothache Remedies.—(1) If there is a cavity in the tooth, a strong solution of common baking soda held in the mouth often gives quick relief. (2) Apply to the defective tooth a bit of cotton saturated in ammonia. (3) Insert in the cavity a piece of cotton damp with the oil of cloves; if after a time this fails to relieve, mix an equal quantity of oil of cloves and oil of cinnamon, oil of peppermint or creosote. Press the cotton dry before applying it, to prevent the swallowing of the liquids.

Warts, To Remove.—Avoid, if possible, the use of the knife or of caustic. A simple remedy, if the warts are on the hand, is to make a strong solution of borax in water as hot as the flesh can bear it, and to let the hand remain in the water for say twenty minutes. Dry the hand and then rub the warts briskly. Do this four or five times and the warts will disappear without leaving scars.

Wash Goods, To Keep Color In.—Immerse them for 3 hours before washing in 1 gallon cold water to which has been added 1 tablespoonful of ordinary turpentine.

Whooping Cough.—Sufferings from this disease may be mitigated by mixing equal parts of oil of pale amber and spirits of hartshorn, and applying the liquid night and morning along the soles of the feet and along the spine, especially the upper part.

Woolens, To Wash.—Use hot soap suds; rinse in clear, cold water and shake out the wet without wringing. Never wring woolens after washing them.

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